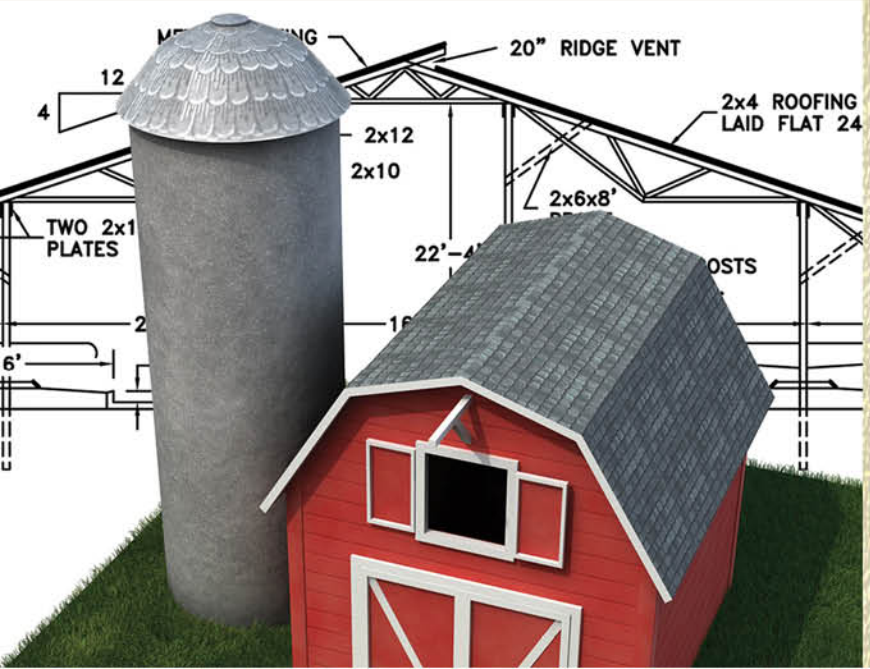
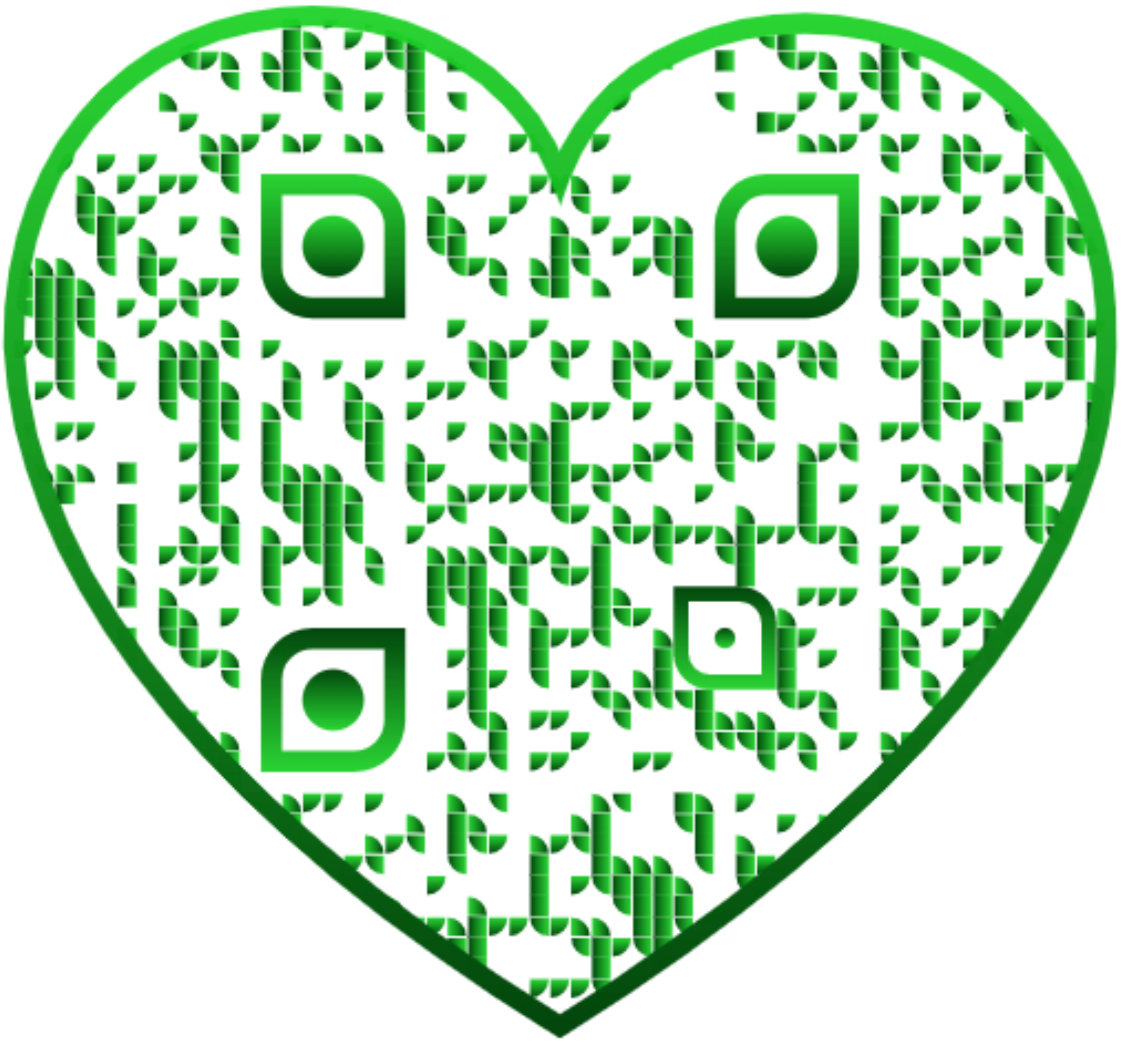
BACK TO BASICS BUILDING

The Complete Guide to BUILDING CLASSIC BARNS,

FENCES, STORAGE SHEDS, ANIMAL PENS, OUTBUILDINGS, GREENHOUSES, FARM EQUIPMENT, & TOOLS



A Step-by-Step Guide to Building Everything You Might Need on a Small Farm



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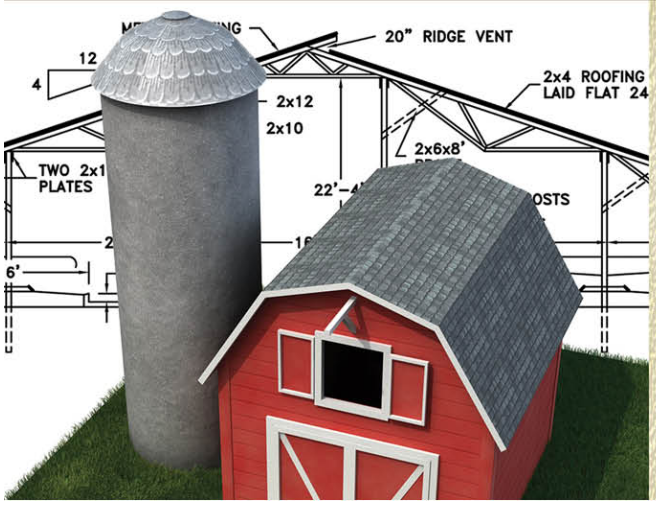

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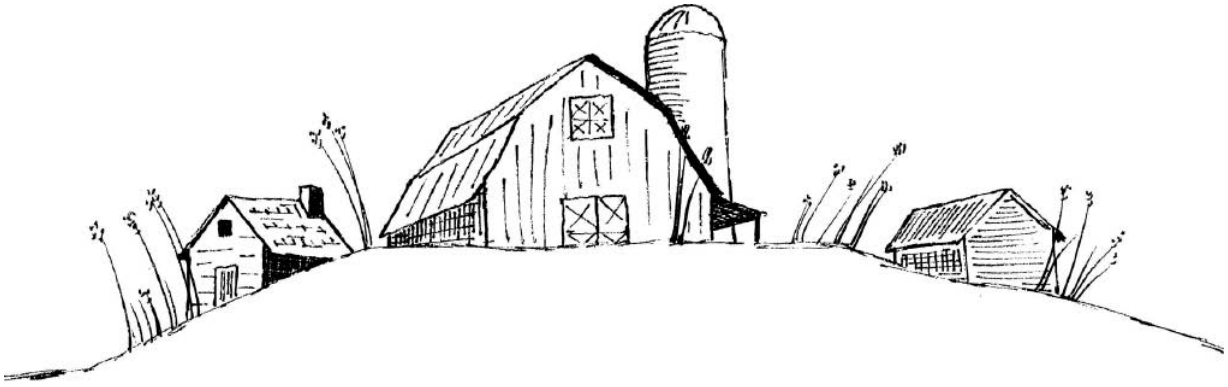

A Step-by-Step Guide to Building Everything You Might Need on a Small Farm

THE COMPLETE GUIDE TO BUILDING CLASSIC BARNS, FENCES, STORAGE SHEDS, ANIMAL PENS, OUTBUILDINGS, GREENHOUSES, FARM EQUIPMENT, & TOOLS: A STEP-BY-STEP GUIDE TO BUILDING EVERYTHING YOU MIGHT NEED ON A SMALL FARM

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A few years back we lost our beloved pet dog Bear, who was not only our best and dearest friend but also the “Vice President of Sunshine” here at Atlantic Publishing. He did not receive a salary but worked tirelessly 24 hours a day to please his parents.

Bear was a rescue dog who turned around and showered myself, my wife, Sherri, his grandparents Jean, Bob, and Nancy, and every person and animal he met (well, maybe not rabbits) with friendship and love. He made a lot of people smile every day.

We wanted you to know a portion of the profits of this book will be donated in Bear’s memory to local animal shelters, parks, conservation organizations, and other individuals and nonprofit organizations in need of assistance.

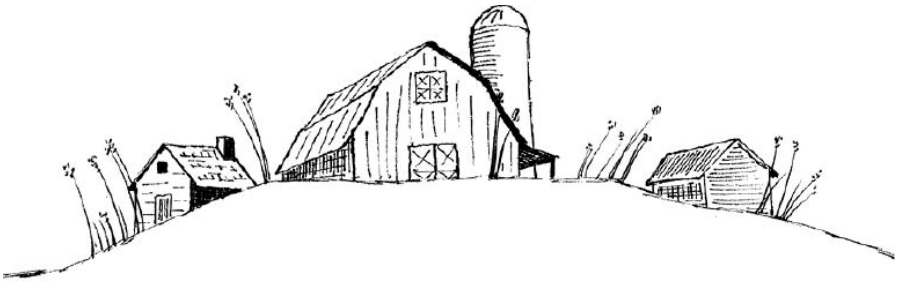
– Douglas and Sherri Brown

PS: We have since adopted two more rescue dogs: first Scout, and the following year, Ginger. They were both mixed golden retrievers who needed a home.

Want to help animals and the world? Here are a dozen easy suggestions you and your family can implement today:

- Adopt and rescue a pet from a local shelter.
- Support local and no-kill animal shelters.
- Plant a tree to honor someone you love.
- Be a developer — put up some birdhouses.
- Buy live, potted Christmas trees and replant them.
- Make sure you spend time with your animals each day.
- Save natural resources by recycling and buying recycled products.
- Drink tap water, or filter your own water at home.
- Whenever possible, limit your use of or do not use pesticides.
- If you eat seafood, make sustainable choices.
- Support your local farmers market.
- Get outside. Visit a park, volunteer, walk your dog, or ride your bike.

Five years ago, Atlantic Publishing signed the Green Press Initiative. These guidelines promote environmentally friendly practices, such as using recycled stock and vegetable-based inks, avoiding waste, choosing energy-efficient resources, and promoting a no-pulping policy. We now use 100-percent recycled stock on all our books. The results: in one year, switching to post-consumer recycled stock saved 24 mature trees, 5,000 gallons of water, the equivalent of the total energy used for one home in a year, and the equivalent of the greenhouse gases from one car driven for a year.



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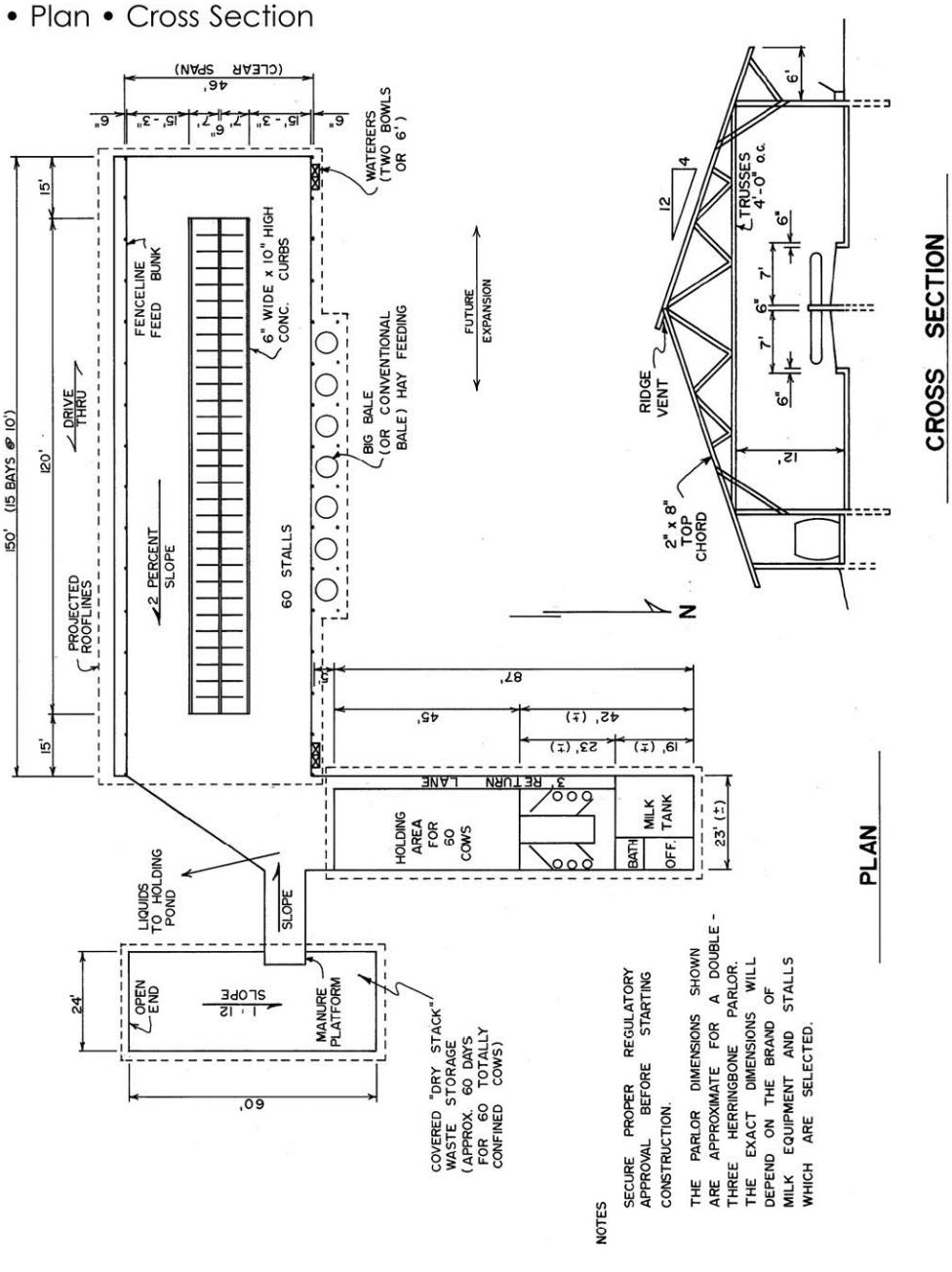
Chapter 1: Dairy Farm Buildings & Equipment

Plans Include:

- 60 Cow Dairy Facility
- 120 Cow Dairy Facility
- 200 Cow Dairy Facility
- 200 Cow Freestall Barn
- Milking Parlor Grounding Details
- Hay Rack & Entry Ramp
- Manure Lip & Continuous Ridge Ventilator
- Sloping Post Free Stall
- Tilt-up Concrete Silage Bunk

60 Cow Dairy Facility

• Plan • Cross Section



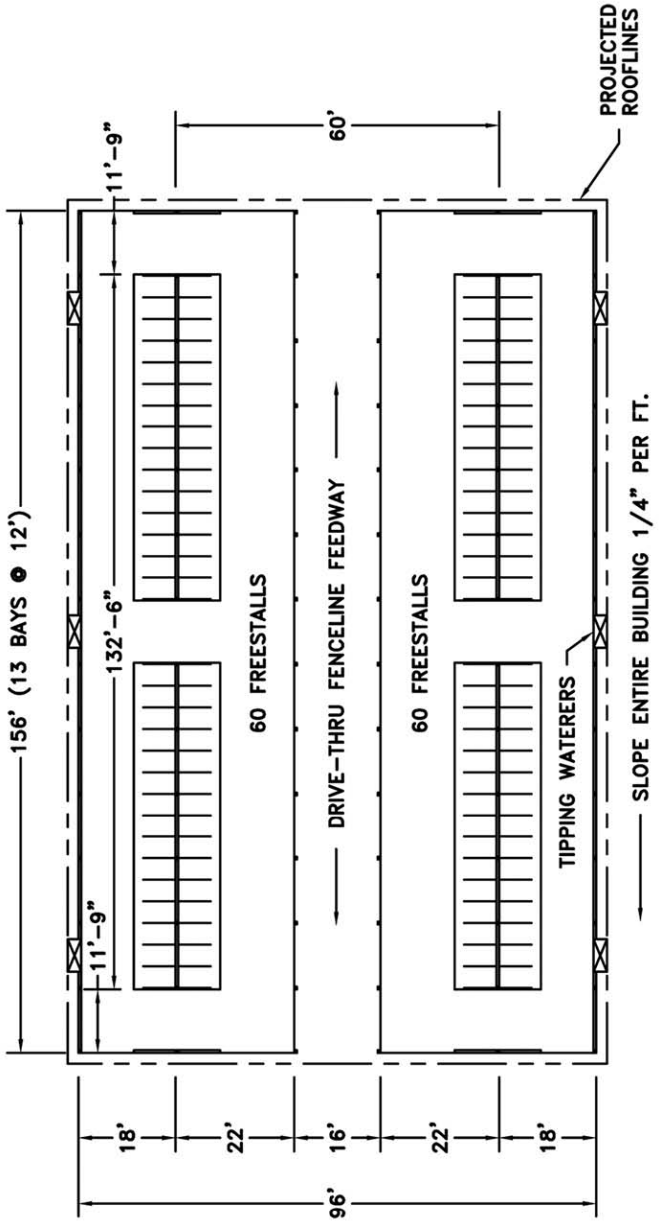
NOTES

SECURE PROPER REGULATORY APPROVAL BEFORE STARTING CONSTRUCTION.

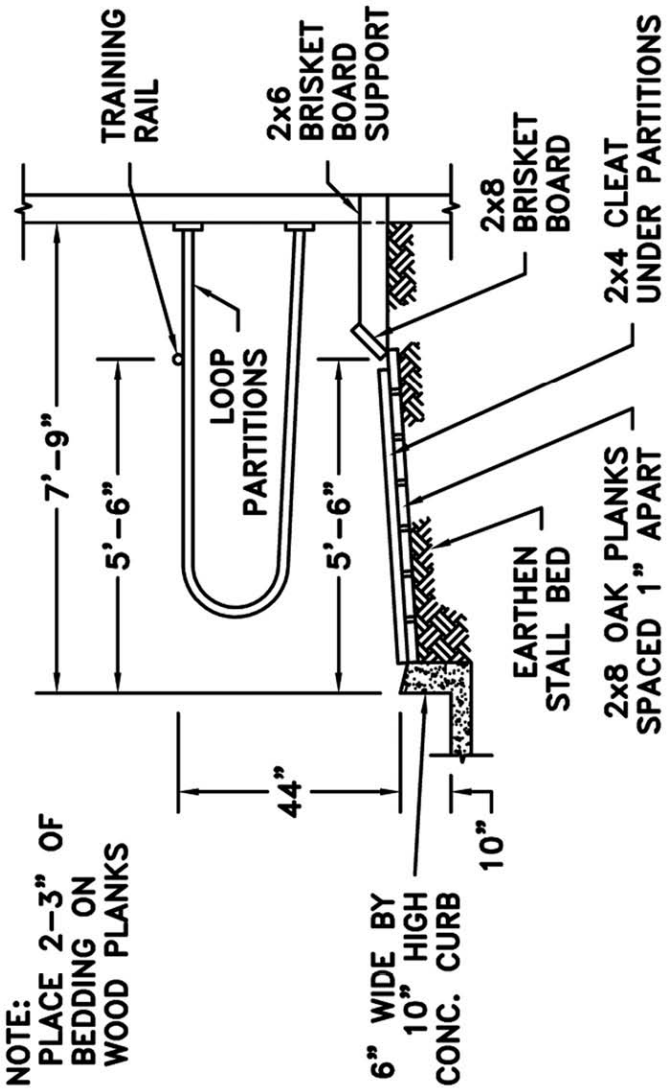
THE PARLOR DIMENSIONS SHOWN ARE APPROXIMATE FOR A DOUBLE - THREE HERRINGBONE PARLOR. THE EXACT DIMENSIONS WILL DEPEND ON THE BRAND OF MILK EQUIPMENT AND STALLS WHICH ARE SELECTED.

120 Cow Dairy Facility

- Plan



• Freestall Detail

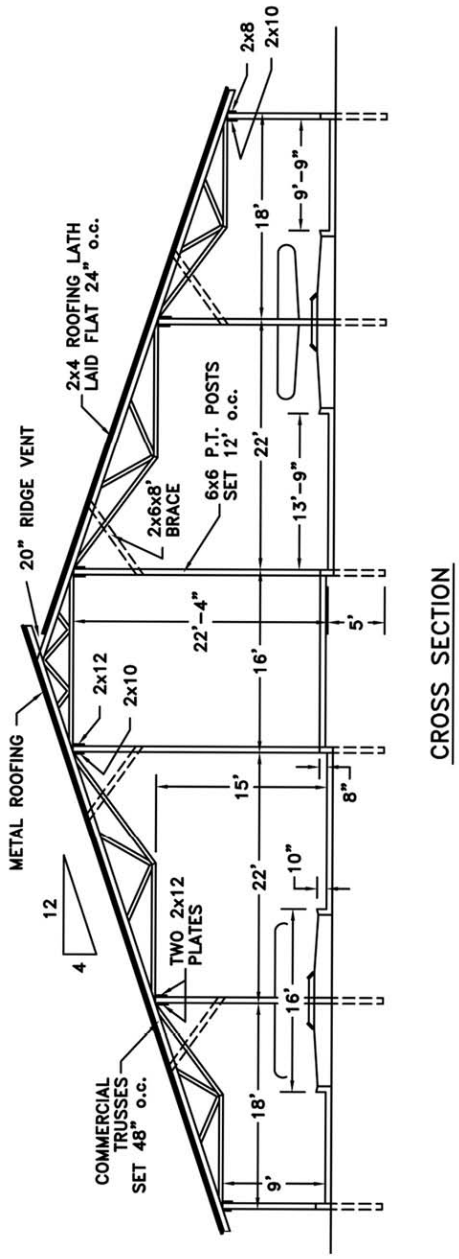


FREESTALL DETAIL

SCALE: 3/16"=1'-0"

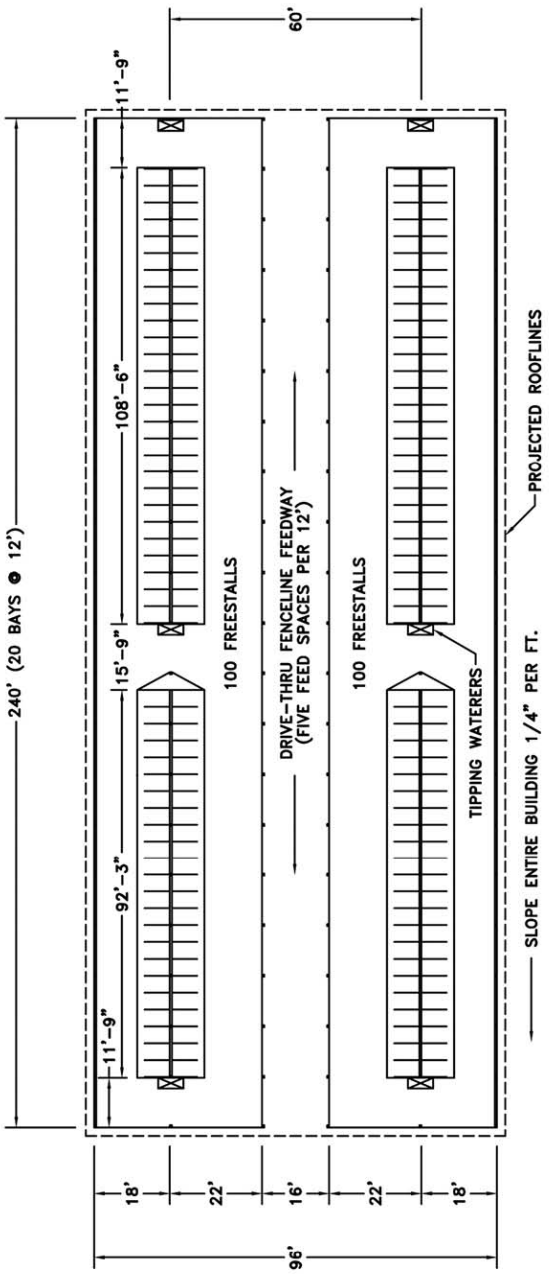
120 Cow Dairy Facility

- Cross Section



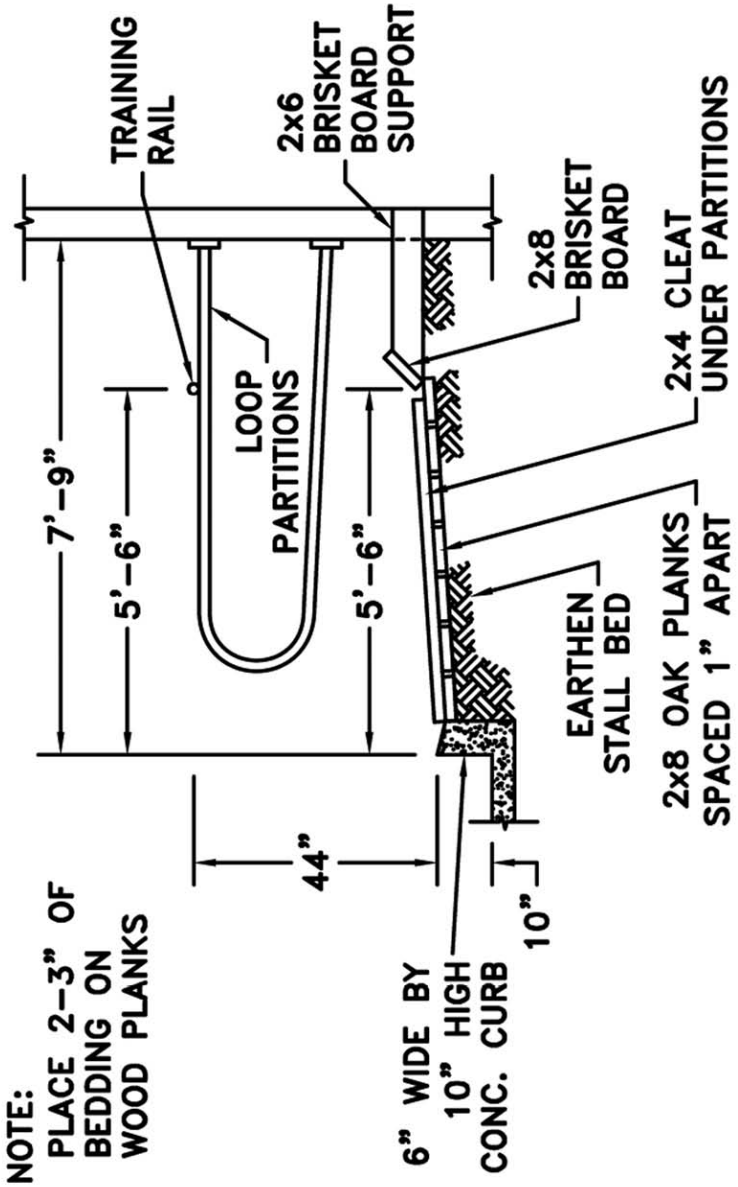
200 Cow Dairy Facility

- Plan



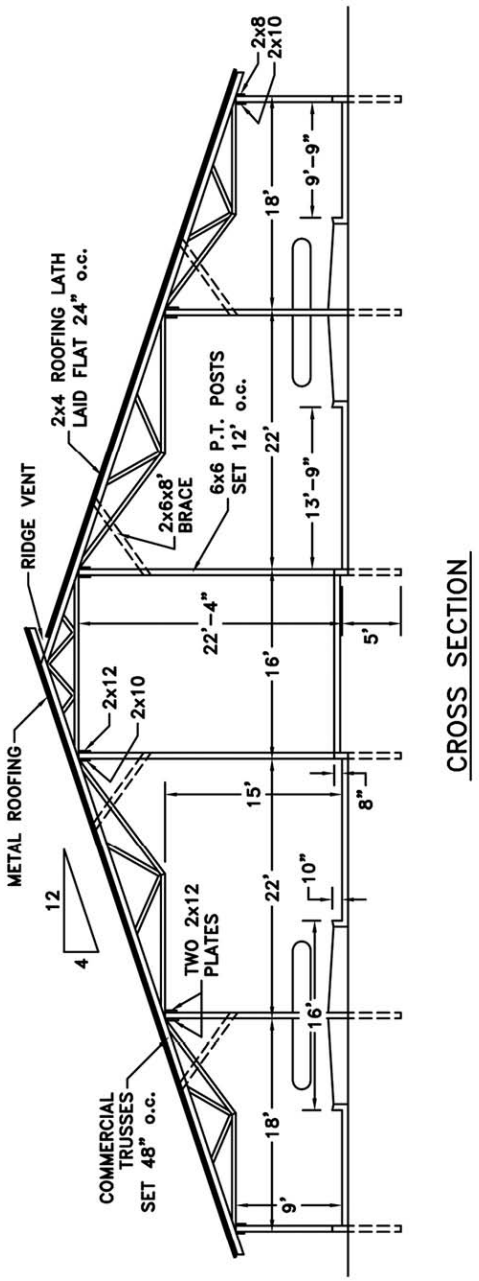
PLAN
SCALE: 1"=40'

- Freestall Detail



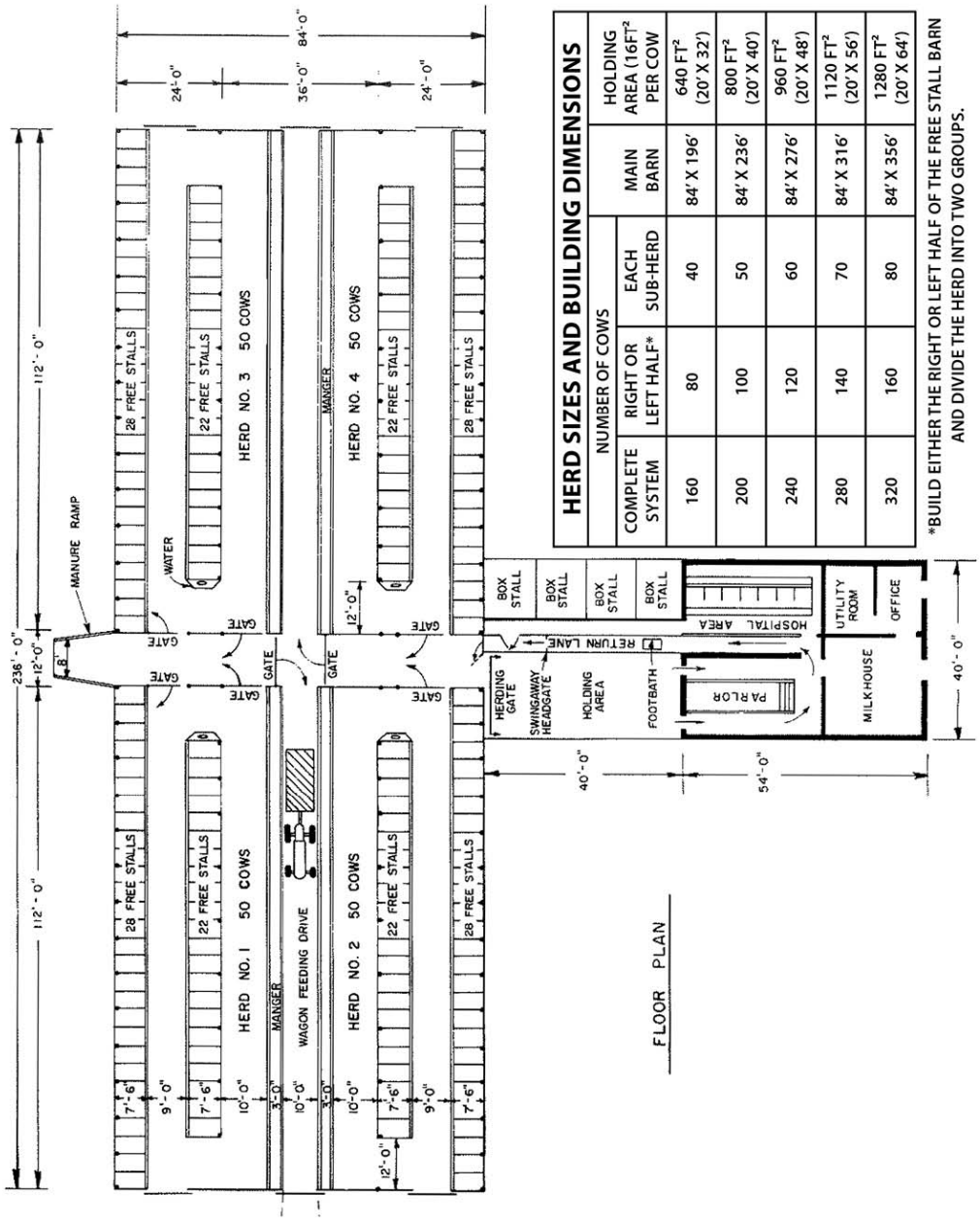
200 Cow Dairy Facility

- Cross Section



200 Cow Freestall Barn

• Floor Plan • Herd Sizes and Building Dimensions



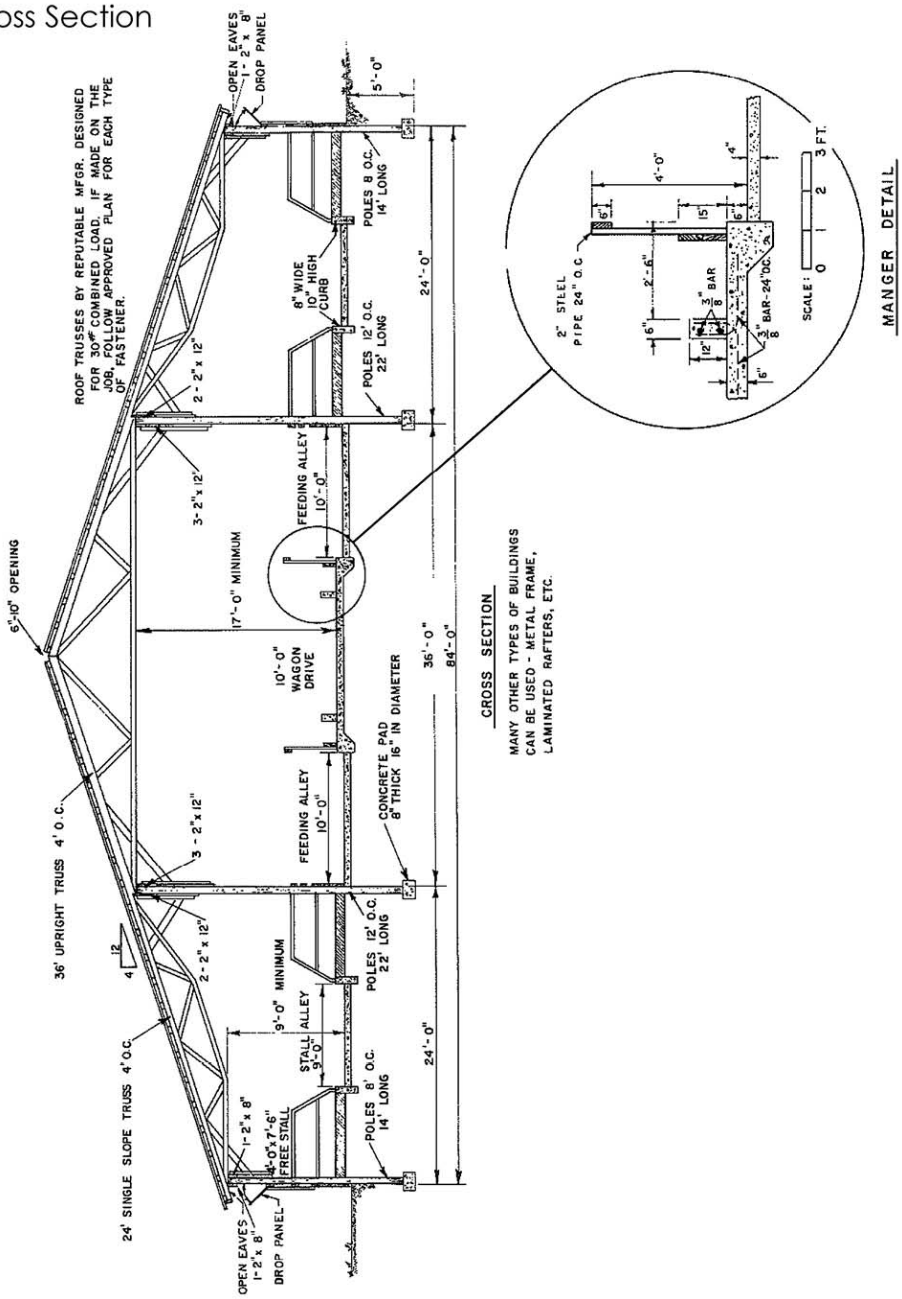
FLOOR PLAN

HERD SIZES AND BUILDING DIMENSIONS				
NUMBER OF COWS			MAIN BARN	HOLDING AREA (16FT² PER COW
COMPLETE SYSTEM	RIGHT OR LEFT HALF*	EACH SUB-HERD		
160	80	40	84' X 196'	640 FT² (20' X 32')
200	100	50	84' X 236'	800 FT² (20' X 40')
240	120	60	84' X 276'	960 FT² (20' X 48')
280	140	70	84' X 316'	1120 FT² (20' X 56')
320	160	80	84' X 356'	1280 FT² (20' X 64')

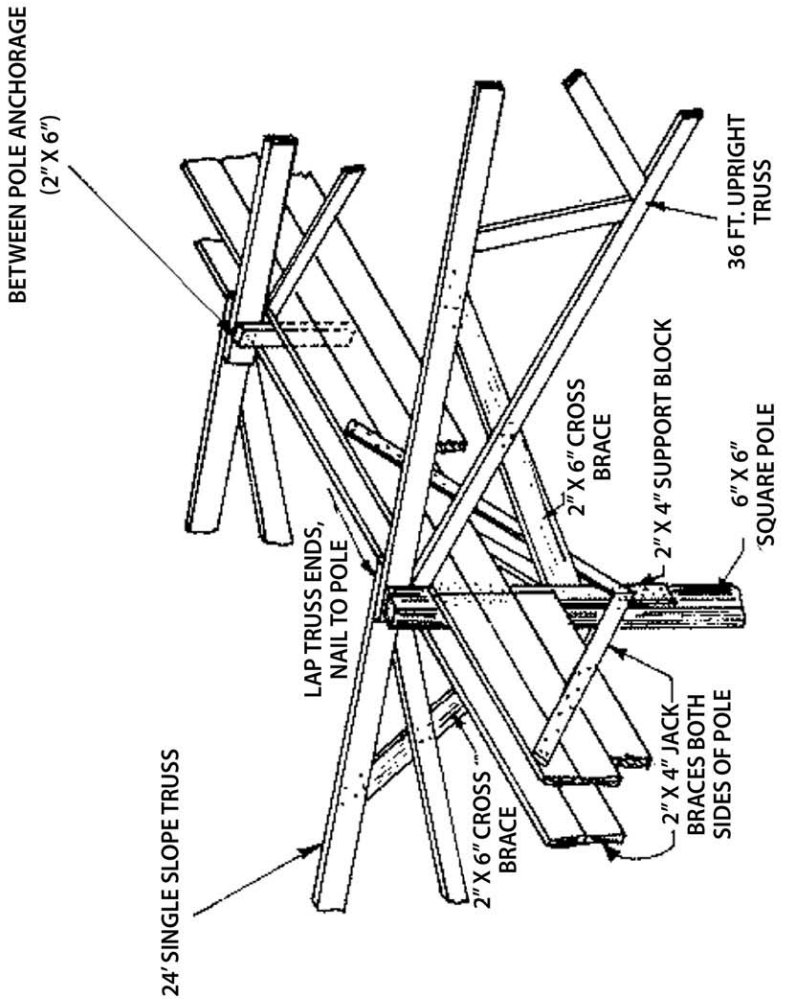
*BUILD EITHER THE RIGHT OR LEFT HALF OF THE FREE STALL BARN AND DIVIDE THE HERD INTO TWO GROUPS.

200 Cow Freestall Barn

- Cross Section

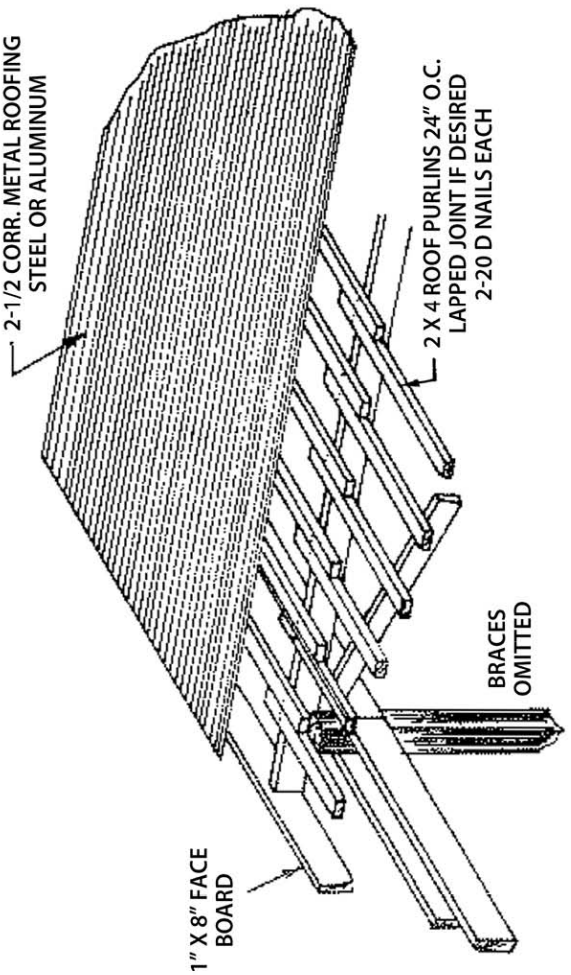

ROOF TRUSSES BY REPUTABLE MFGR. DESIGNED FOR 30# COMBINED LOAD. IF MADE ON THE JOB, FOLLOW APPROVED PLAN FOR EACH TYPE OF FASTENER.
OPEN EAVES 1-2" x 8" DROP PANEL
5'-0"
POLES 8 O.C. 14' LONG
8" WIDE 10" HIGH CURB
POLES 12' O.C. 22' LONG
24'-0"
2-2" x 12"
3-2" x 12"
FEEDING ALLEY 10'-0"
17'-0" MINIMUM
6"-10" OPENING
10'-0" WAGON DRIVE
35'-0"
84'-0"
CONCRETE PAD 8" THICK 16' IN DIAMETER
36' UPRIGHT TRUSS 4' O.C.
3-2" x 12"
FEEDING ALLEY 10'-0"
2-2" x 12"
9'-0" MINIMUM
STALL ALLEY 9'-0"
POLES 12' O.C. 22' LONG
24'-0"
24' SINGLE SLOPE TRUSS 4' O.C.
1-2" x 8"
4'-0" x 7'-6" FREE STALL
POLES 8' O.C. 14' LONG
OPEN EAVES 1-2" x 8" DROP PANEL
CROSS SECTION
MANY OTHER TYPES OF BUILDINGS CAN BE USED - METAL FRAME, LAMINATED RAFTERS, ETC.
2" STEEL PIPE 24" O.C.
4'-0"
2'-6"
3/8" BAR
3/8" BAR - 24" O.C.
SCALE: 0 1 2 3 FT.
MANGER DETAIL

- Interior Pole Bracing and Rafter Detail

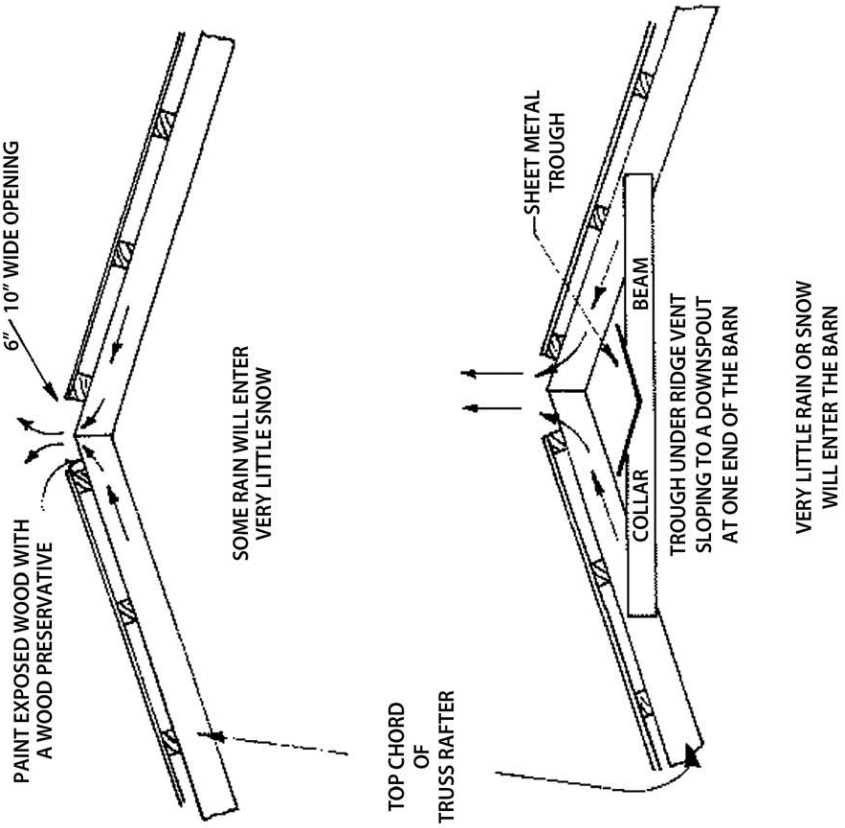


200 Cow Freestall Barn

- Roofing Detail with Purlins and Metal Roofing

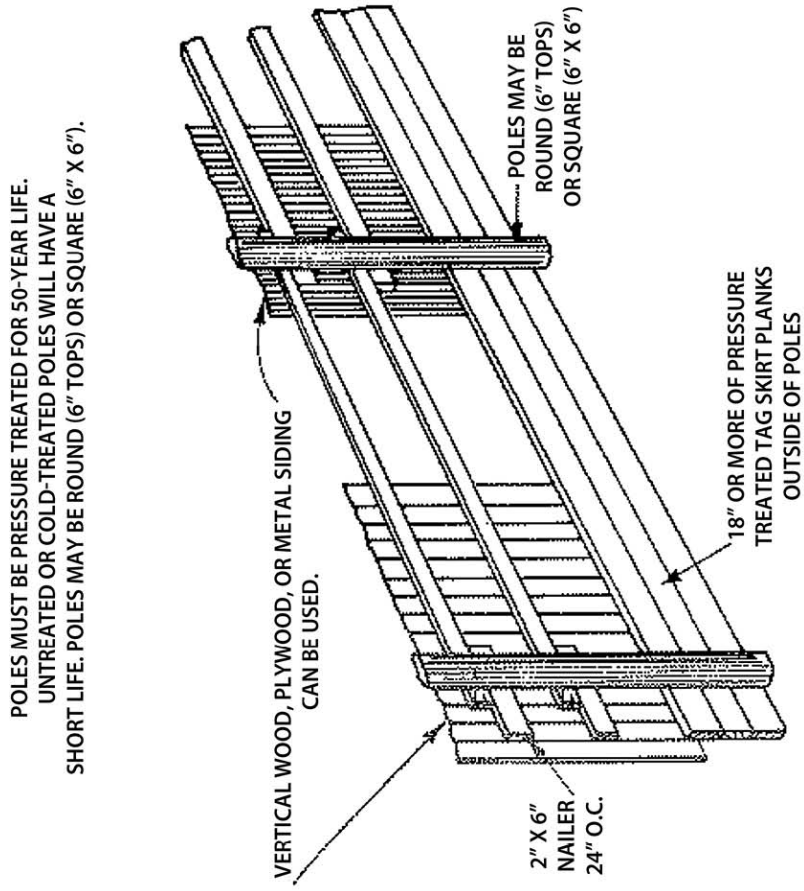


• Open Ridge Vent Detail

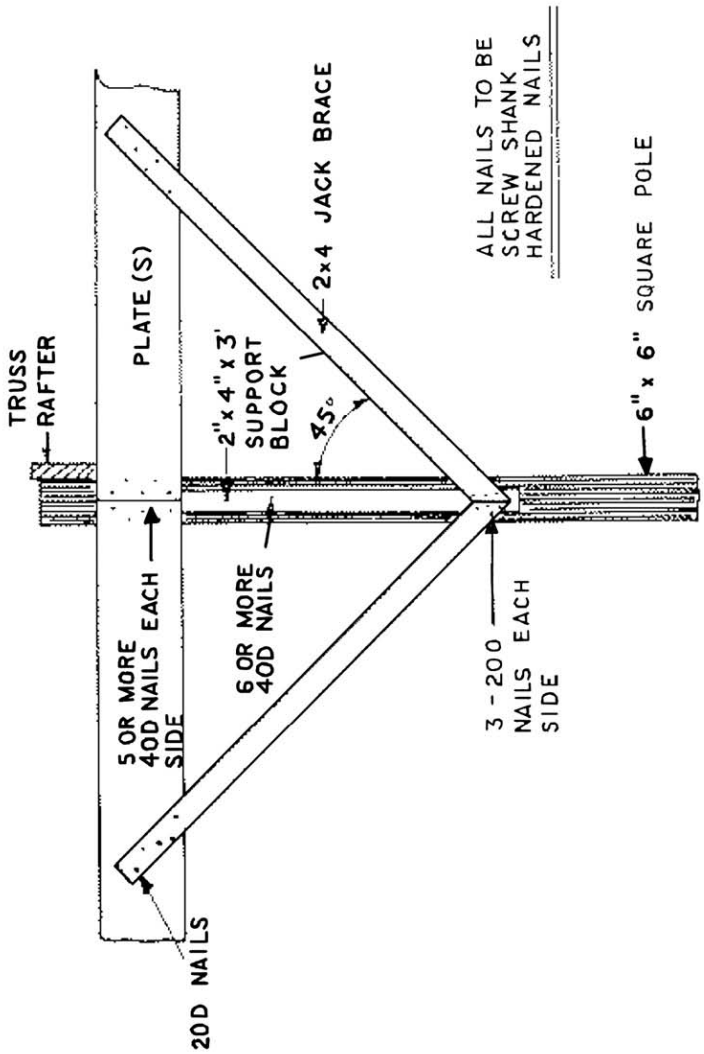

6" 10" WIDE OPENING
PAINT EXPOSED WOOD WITH A WOOD PRESERVATIVE
SOME RAIN WILL ENTER VERY LITTLE SNOW
TOP CHORD OF TRUSS RAFTER
SHEET METAL TROUGH
BEAM
COLLAR
TROUGH UNDER RIDGE VENT SLOPING TO A DOWNSPOUT AT ONE END OF THE BARN
VERY LITTLE RAIN OR SNOW WILL ENTER THE BARN

200 Cow Freestall Barn

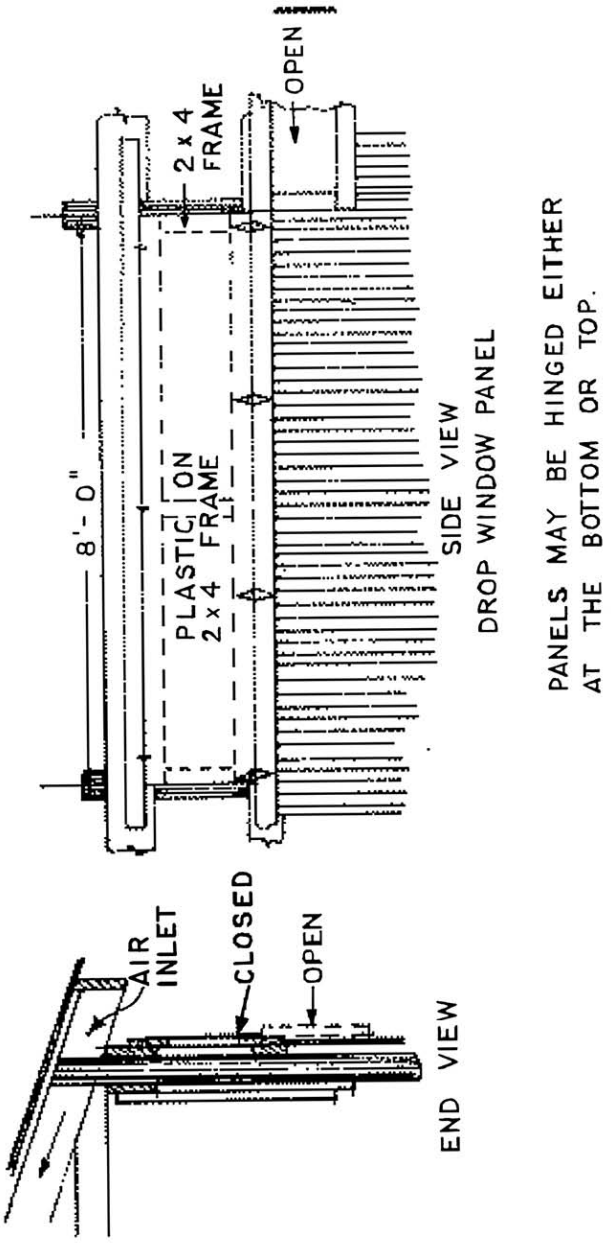
- Side Wall Detail


POLES MUST BE PRESSURE TREATED FOR 50-YEAR LIFE.
UNTREATED OR COLD-TREATED POLES WILL HAVE A
SHORT LIFE. POLES MAY BE ROUND (6" TOPS) OR SQUARE (6" X 6").
POLES MAY BE
ROUND (6" TOPS)
OR SQUARE (6" X 6")
VERTICAL WOOD, PLYWOOD, OR METAL SIDING
CAN BE USED.
18" OR MORE OF PRESSURE
TREATED TAG SKIRT PLANKS
OUTSIDE OF POLES
2" X 6"
NAILER
24" O.C.

- Side Wall Pole Bracing and Nailing Detail

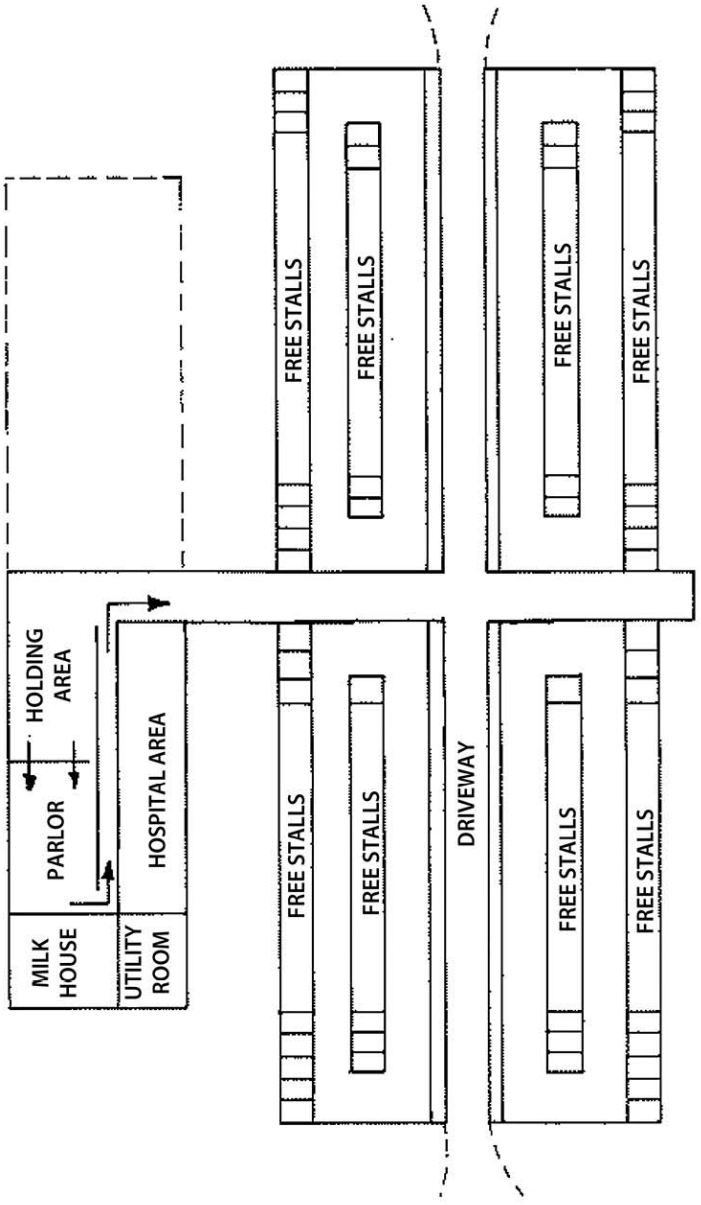

TRUSS RAFTER
PLATE (S)
2"x 4" x 3' SUPPORT BLOCK
2x4 JACK BRACE
45°
ALL NAILS TO BE SCREW SHANK HARDENED NAILS
6" x 6" SQUARE POLE
5 OR MORE 40D NAILS EACH SIDE
6 OR MORE 40D NAILS
3 - 200 NAILS EACH SIDE
20D NAILS

- Panel Window Detail



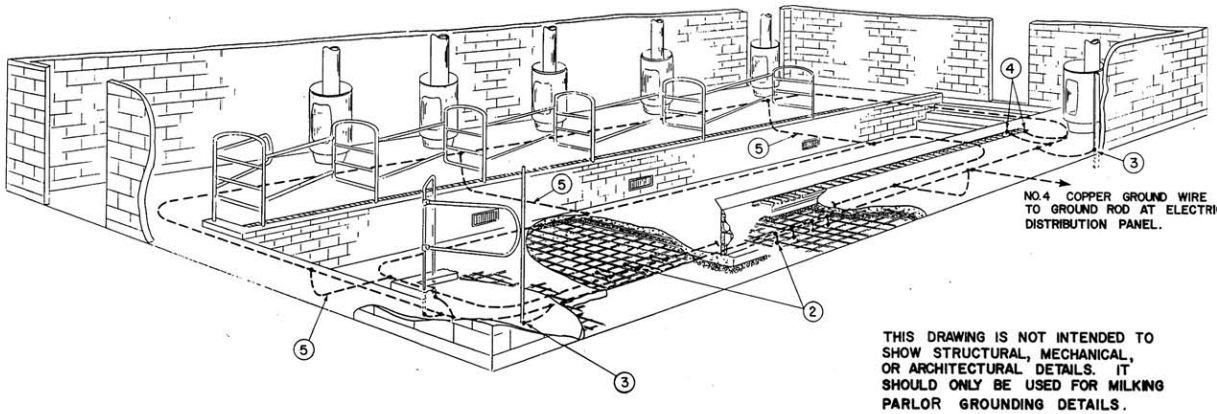
200 Cow Freestall Barn

- Alternate Location for the Milking Center, Holding Area, and Hospital Area



MILKING PARLOR GROUNDING DETAILS

• Perspective • Notes



THIS DRAWING IS NOT INTENDED TO SHOW STRUCTURAL, MECHANICAL, OR ARCHITECTURAL DETAILS. IT SHOULD ONLY BE USED FOR MILKING PARLOR GROUNDING DETAILS.

NOTES:

1. NOTE ABOUT EFFECTS OF AN EQUIPOTENTIAL PLANE: IF THE FLOOR IS AT THE SAME POTENTIAL AS THE CONDUCTIVE EQUIPMENT AND ANY STRUCTURES ACCESSABLE TO THE ANIMAL, STRAY VOLTAGE PROBLEMS CANNOT EXIST. THIS CAN BE ACCOMPLISHED BY PLACING A BONDED NETWORK OF WELDED WIRE MESH IN THE FLOOR. ANY ANIMAL STANDING ON A FLOOR CONTAINING A PROPERLY INSTALLED EQUIPOTENTIAL PLANE WILL HAVE ALL POSSIBLE CONTACT POINTS AT OR VERY NEAR THE SAME POTENTIAL.

2. BOND NO.4 COPPER WIRE TO 6" x 6" (UP TO 12" x 12" IS OK) WIRE MESH IN CONCRETE FLOOR, 2 OR 3 TIMES PER EACH CONT. SECTION OF MESH.

3. IF THERE IS A POSSIBILITY FOR ENERGIZING DUE TO A LOCAL ELECTRICAL FAULT SUCH AS ELECTRIC EQUIPMENT NOT BEING PROPERLY GROUNDED, THEN STEEL POSTS, GATE POSTS, SUPPORT POSTS, FEEDER BRACKETS, ETC. SHOULD BE GROUNDED ACCORDING TO THE NATIONAL ELECTRIC CODE.

4. ANGLE IRON GRATE SUPPORTS FOR FLOOR DRAINS TO BE BONDED BY RESISTANCE WELDING AT 2 OR MORE POINTS FOR EACH CONT. SECTION.

5. 6" x 6" WIRE MESH ON FLOOR OF PIT CONNECTED AT 2 POINTS TO MESH IN COW PLATFORM FLOOR.

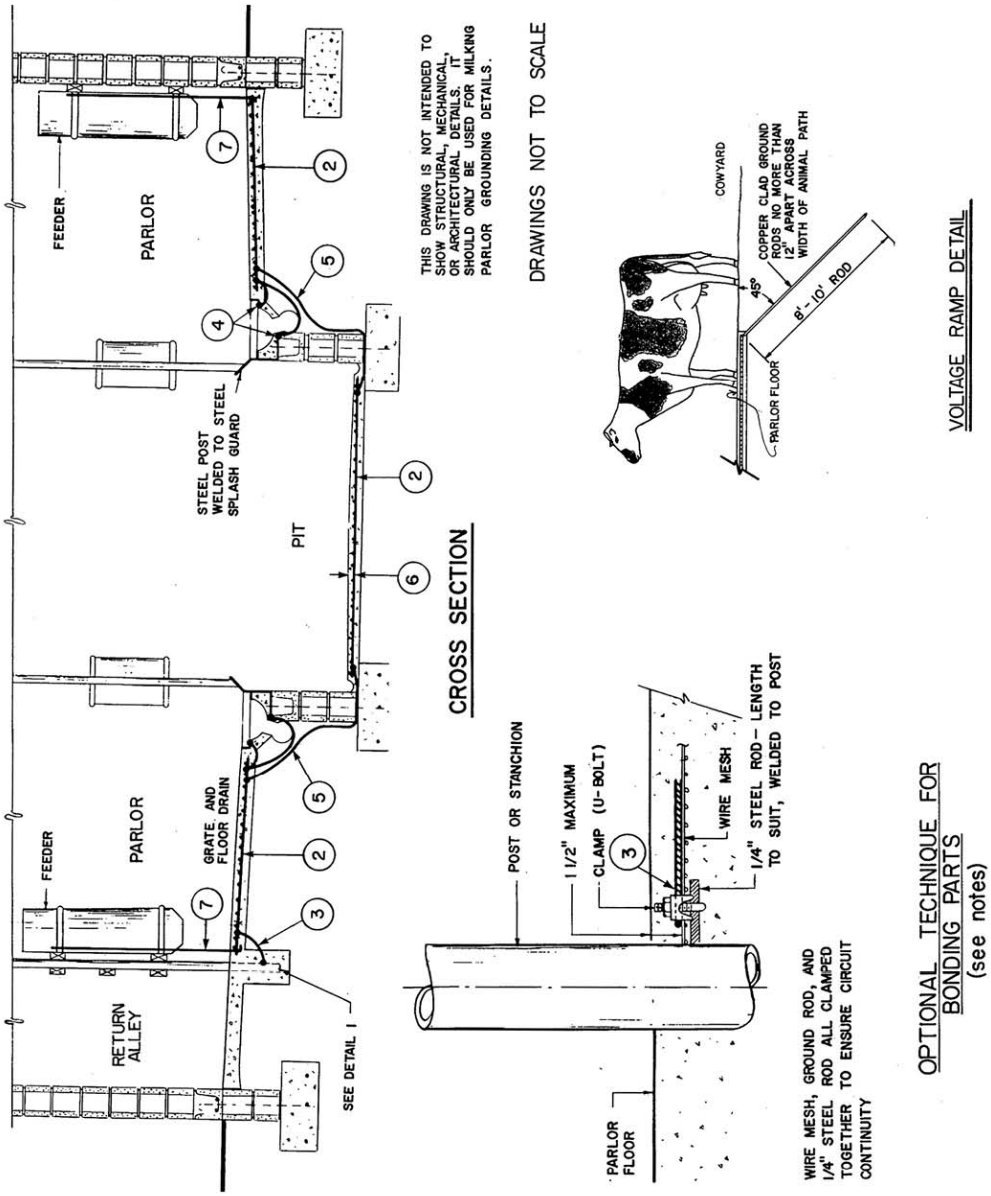
6. WIRE MESH TO HAVE A PROTECTIVE CONCRETE COVER TO PROTECT MESH FROM CORROSION OR DAMAGE (1" IS SUFFICIENT, BUT 1 1/2" IS BETTER).

7. 1/4" ROUND STEEL ROD WELDED (RESISTANCE OR EXOTHERMIC) TO FEEDER, EXTENDING DOWN TO WIRE MESH. WELD OR BRAZE 1/4" ROD, MESH, AND NO.4 COPPER GROUND WIRE TOGETHER. INSTALL 2 RODS PER SIDE OF PARLOUR PROVIDED THAT ALL FEEDERS ARE INTERCONNECTED BY METAL PARTS. NOTE: CONDUCTORS AND CONNECTIONS SHOULD BE LOCATED WHERE THEY CANNOT BE EASILY DAMAGED OR DISTURBED.

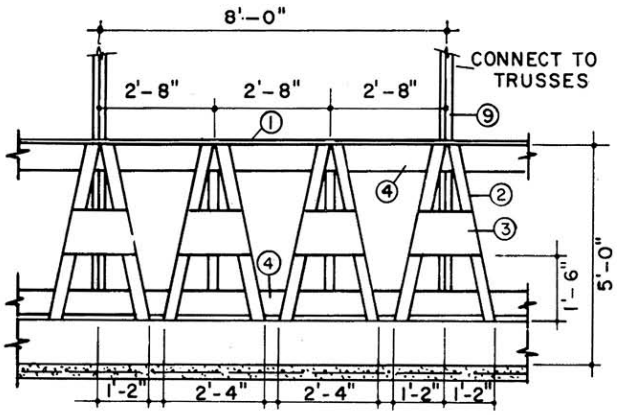
8. UNDER SERIOUS CONDITIONS, AN ANIMAL MAY BE EFFECTED WHEN IT STEPS ONTO THE EQUIPOTENTIAL PLANE FROM AN AREA BEYOND THE PERIMETER. TO PROVIDE A MORE GRADUAL CHANGE IN VOLTAGE, A VOLTAGE RAMP SOULD BE INSTALLED AT THE ENTRANCE OR EXIT OF THE EQUIPOTENTIAL PLANE. (SEE VOLTAGE RAMP DETAIL)

Milking Parlor Grounding Details

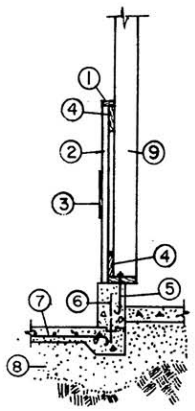
- Cross Section • Optional Technique for Bonding Parts
- Voltage Ramp Detail


FEEDER
PARLOR
STEEL POST WELDED TO STEEL SPLASH GUARD
PIT
GRATE AND FLOOR DRAIN
RETURN ALLEY
SEE DETAIL 1
THIS DRAWING IS NOT INTENDED TO SHOW STRUCTURAL, MECHANICAL, OR ARCHITECTURAL DETAILS. IT SHOULD ONLY BE USED FOR MILKING PARLOR GROUNDING DETAILS.
DRAWINGS NOT TO SCALE
CROSS SECTION
POST OR STANCHION
1 1/2" MAXIMUM
CLAMP (U-BOLT)
WIRE MESH
1/4" STEEL ROD- LENGTH TO SUIT, WELDED TO POST
PARLOR FLOOR
WIRE MESH, GROUND ROD, AND 1/4" STEEL ROD ALL CLAMPED TOGETHER TO ENSURE CIRCUIT CONTINUITY
OPTIONAL TECHNIQUE FOR BONDING PARTS
(see notes)
COWYARD
45°
COPPER CLAD GROUND RODS NO MORE THAN 12" APART ACROSS WIDTH OF ANIMAL PATH
8' - 10' ROD
PARLOR FLOOR
VOLTAGE RAMP DETAIL

HAY RACK & ENTRY RAMP



ELEVATION

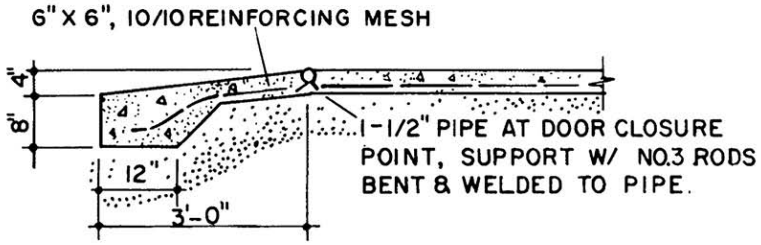


CROSS SECTION

NOTES

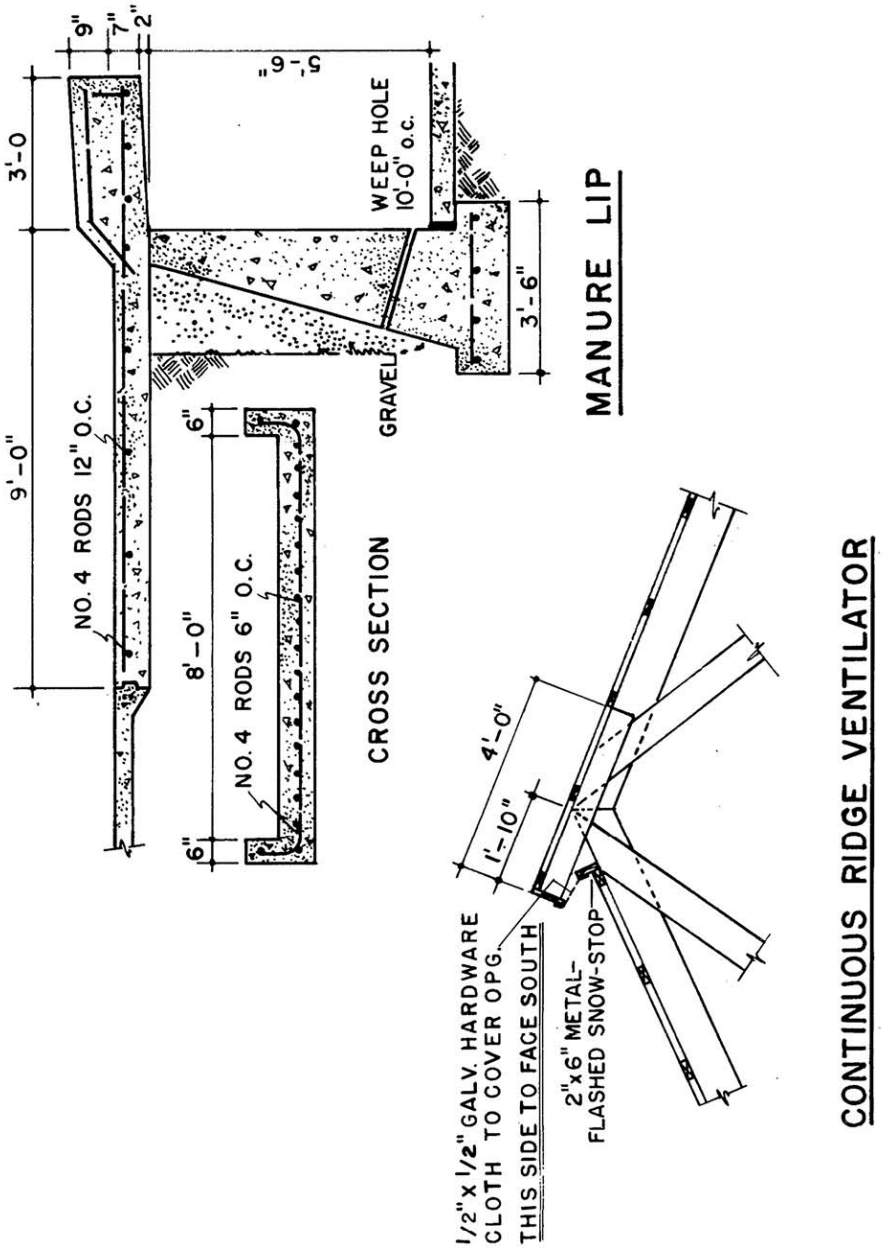
1. 2" X 4" X 16'-0" CAP
2. 2" X 4" X 4'-0" HAY RACK MEMBER
3. 1" X 12" X 1'-9" " " "
4. 2" X 6" X 16'-0"
5. 3/8" ANCHOR BOLT 4'-0" O.C.
6. NO. 3 RE. ROD, 1'-6" LONG, 12" O.C.
7. 6" X 6", 10/10 REINFORCING MESH
8. GRAVEL FILL
9. TWO 2" X 6" X 7'-0" STALL POST

HAY RACK



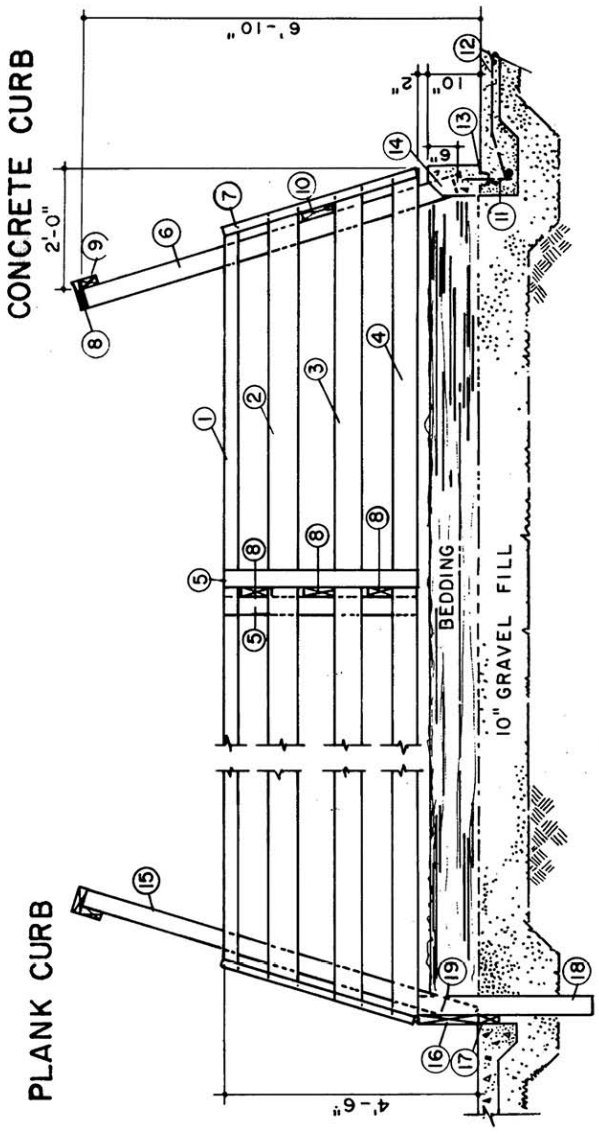
ENTRY RAMP

MANURE LIP & CONTINUOUS RIDGE VENTILATOR



Sloping Post Free Stall

• Plank Curb • Concrete Curb • Notes



NOTES

1. 2"x 4"x13'-0" PARTITION PLANK
2. 2"x 6"x13-8" " "
3. 2"x 6"x14'-4" " "
4. 2"x 6"x14'-8" " "
5. 2"x 4"x 3'-4" BRACE
6. 4"x 4"x 7'-0" STALL POST
7. 2"x 2" x3'-6" NAILER
8. 2"x6" x12'-0"
9. 2"x4" x12'-0"
10. 2"x 6"x 4'-0" RESTRAINER
11. no.3 (3/8") REINFORCING ROD 12"o.c.
12. 6"x 6", 10/10 WIRE REINFORCING MESH
13. 1"x 2" KEY CAST IN ALLEY FLOOR
14. 4"x 4"x4" SOCKET CAST IN CURB
15. 4"x 4"x 7'-0" STALL POST
16. 2"x 12" PRESSURE-TREATED PLANK
17. 2"x 4" " "
18. 4" DIAM. x 3'-0" P. T. POST
19. 1/2" GALVANIZED CARRIAGE BOLTS

SLOPING POST FREE STALL

TILT-UP CONCRETE SILAGE BUNK

• Tilt-up Slab Side Elevation • Cross Section

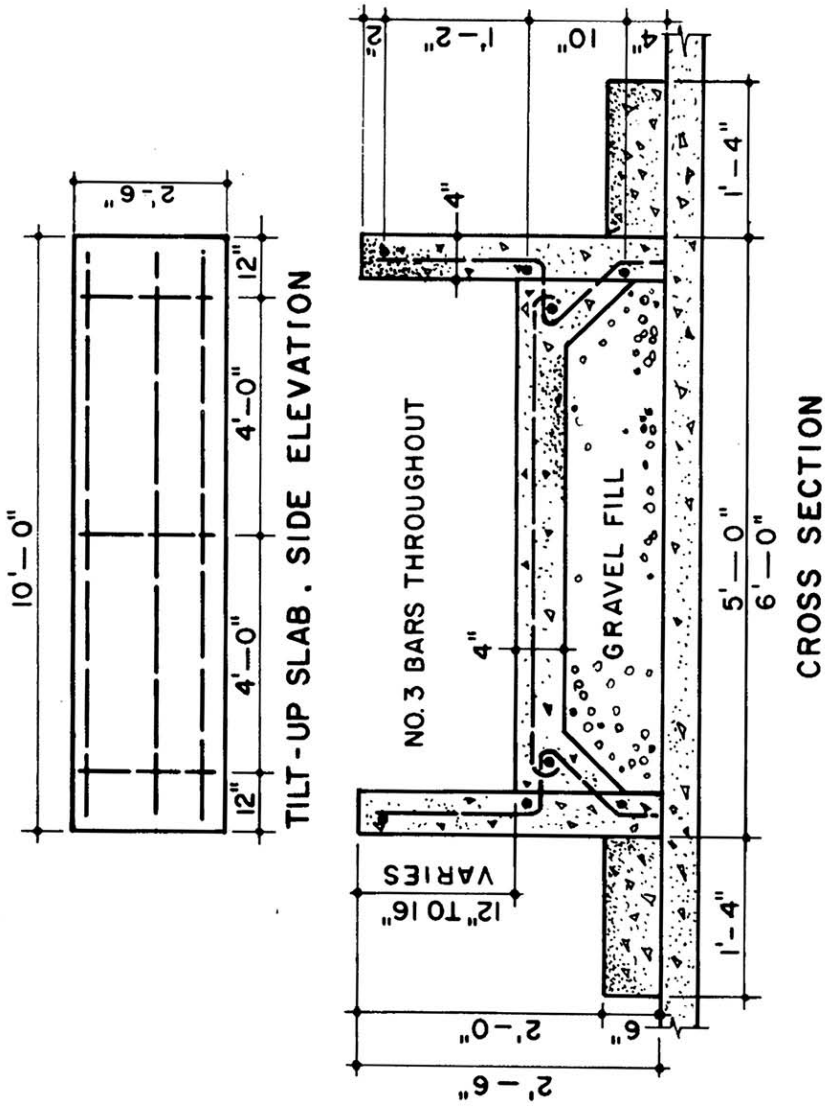
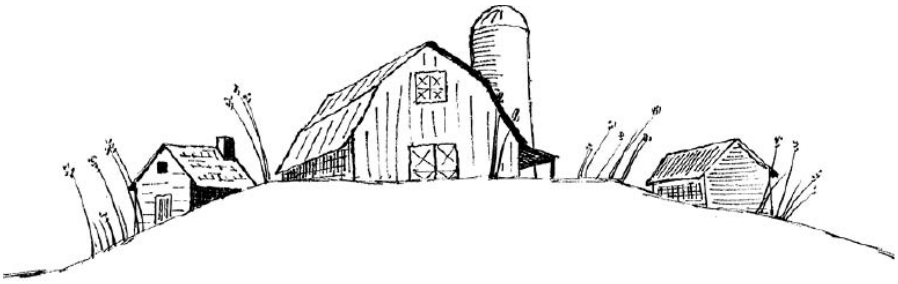


Table of Contents



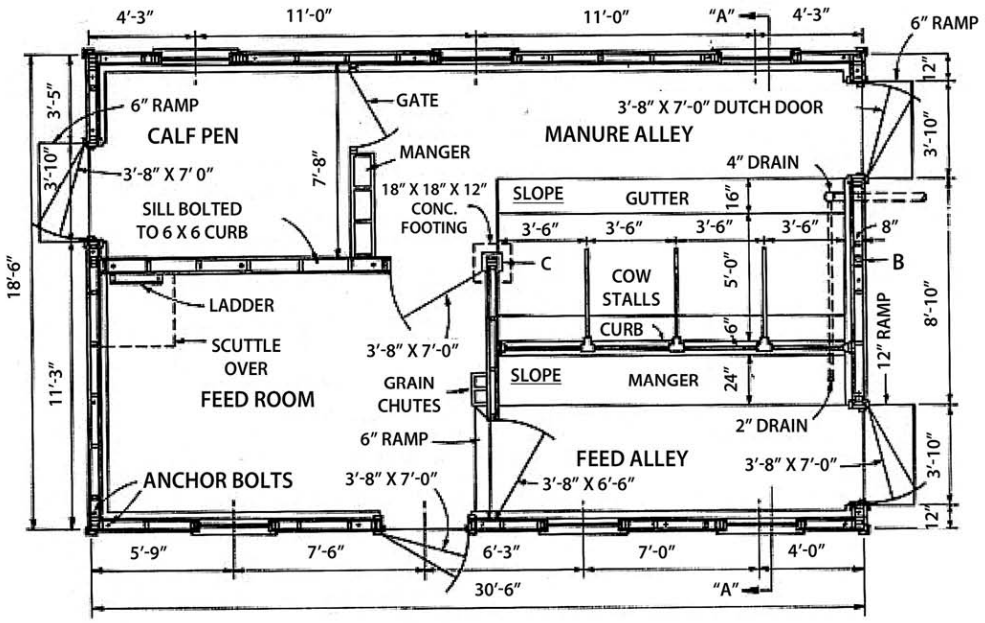
Chapter 2: Cattle Barns, Hutches, Pens, & Equipment

Plans Include:

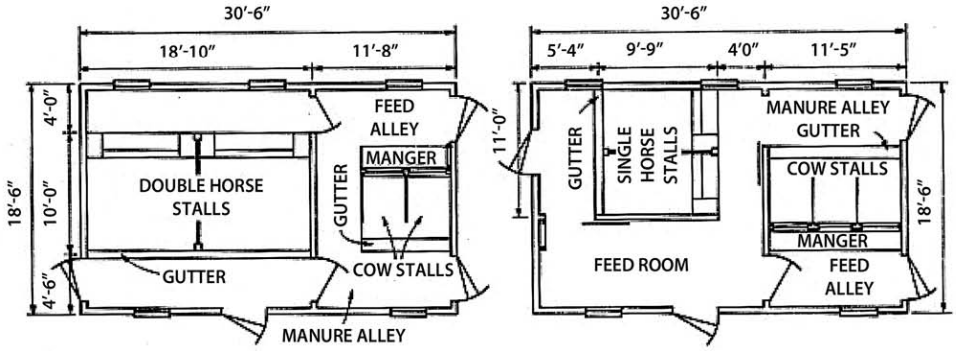
- 18x30 Wood-Framed General Barn
- Partial Hayloft
- Calf Hutch with Moveable Paddock
- Elevated Wood Calf Stall
- Steel-Framed Portable Calf Pen
- Wood-Framed Portable Calf Pen
- Feed Rack for Portable Calf Pen
- 9x4x4 Cattle Breeding Rack
- Cattle Guard I
- Cattle Guard II

18x30 Wood-Framed General Barn

• Plan • Alternate Plans



PLAN



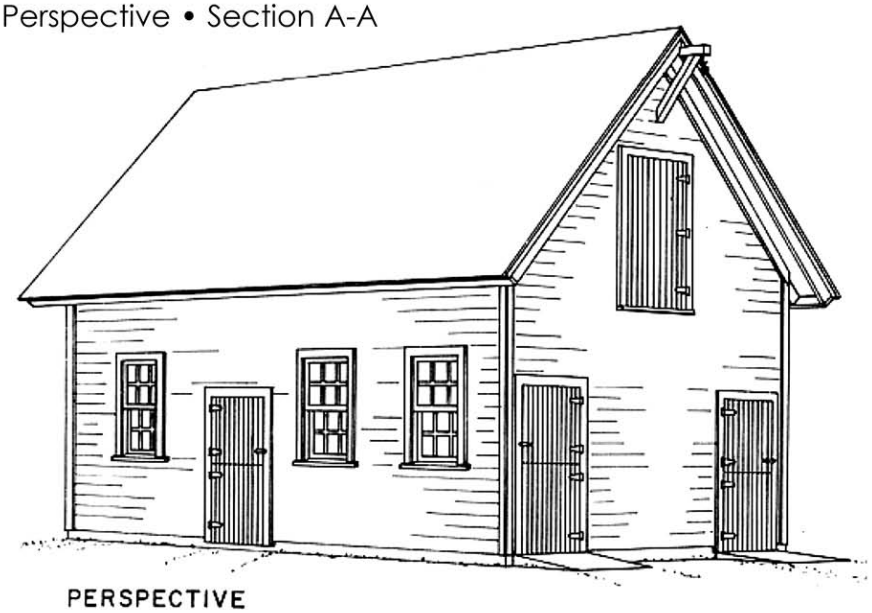
ALTERNATE PLANS

SCALE: 1/0" = 1'0"

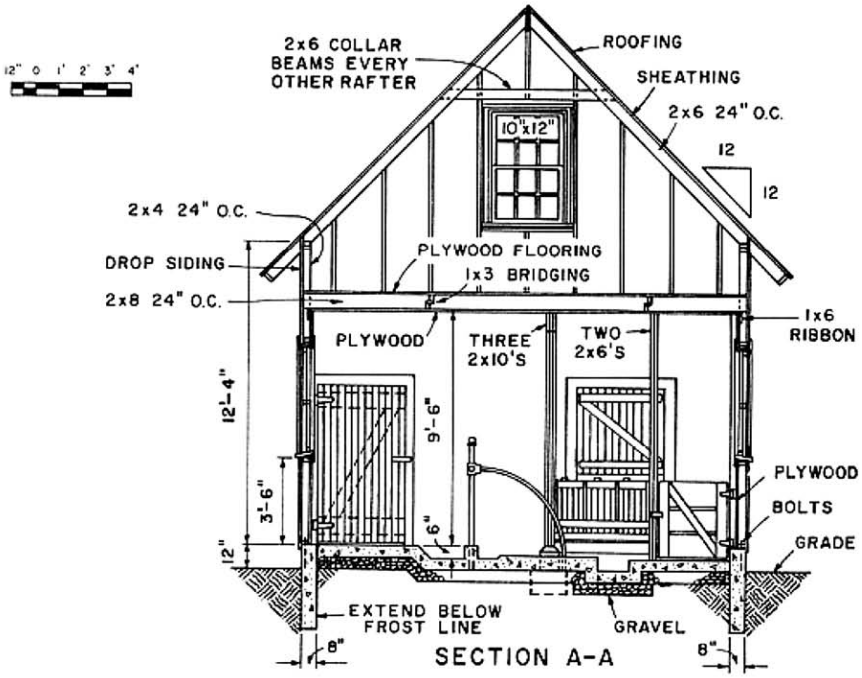
12"0 4' 8'

18x30 Wood-Framed General Barn

• Perspective • Section A-A



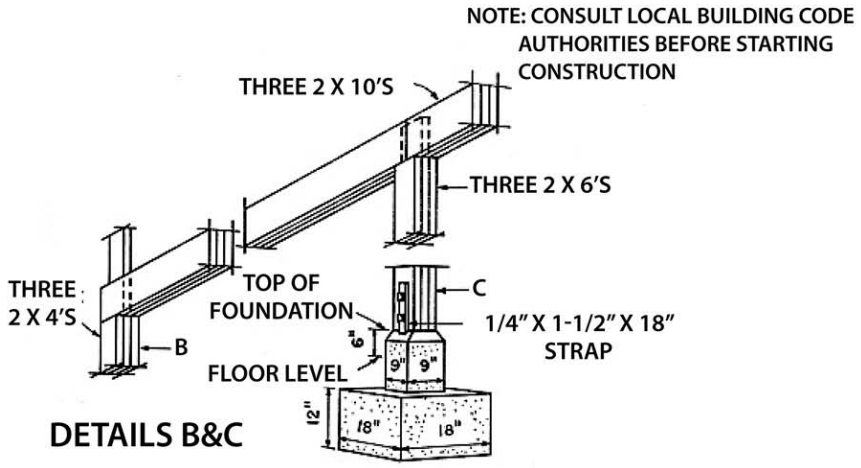
PERSPECTIVE



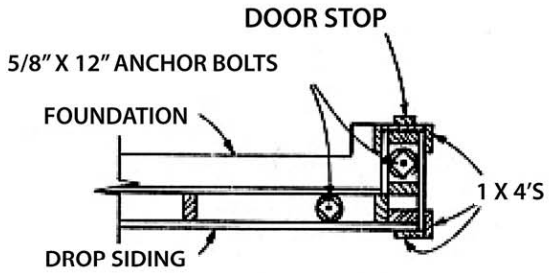
SECTION A-A

18x30 Wood-Framed General Barn

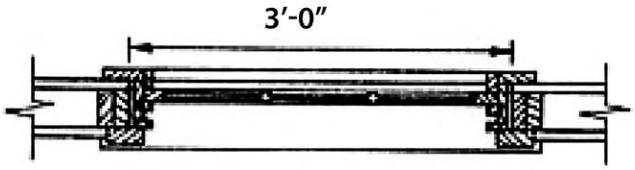
• Details B&C • Section at Corner • Section of Window



DETAILS B&C



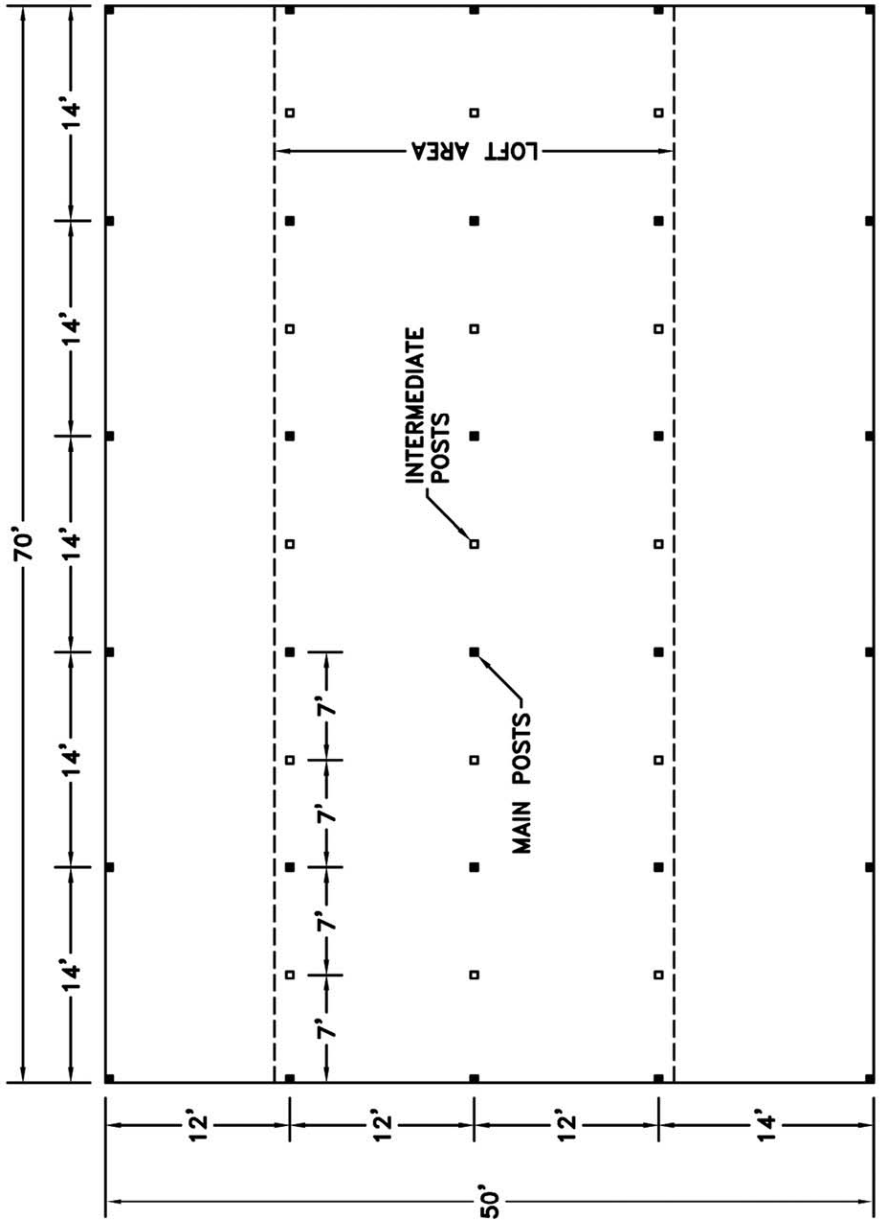
SECTION AT CORNER



SECTION OF WINDOW

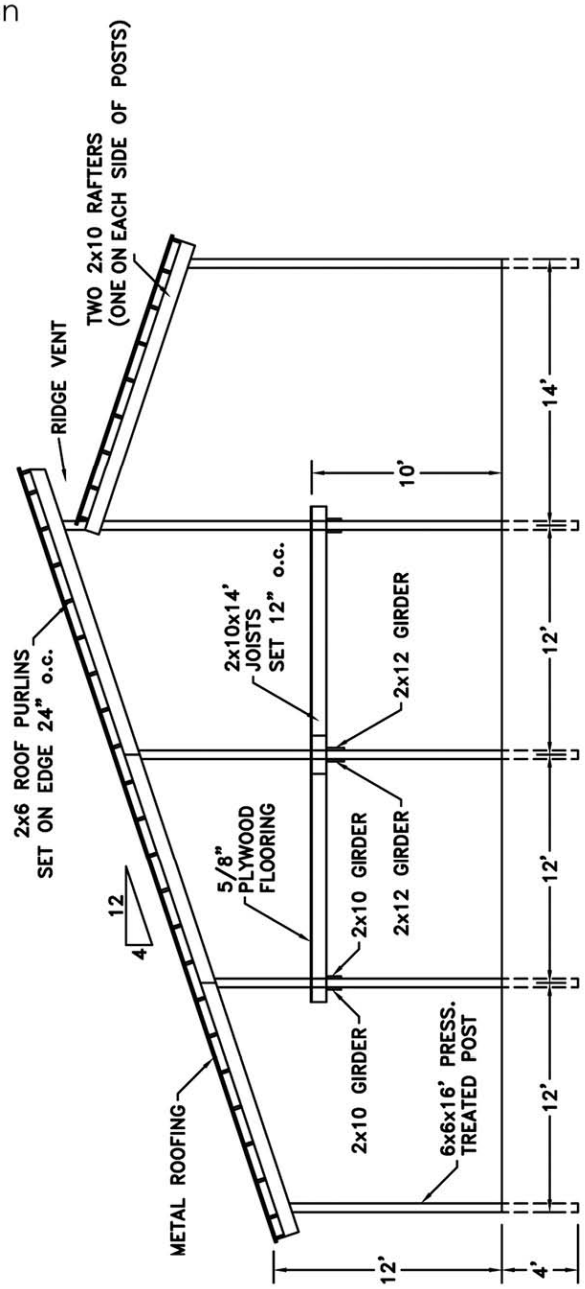
Partial Hayloft

- Plan



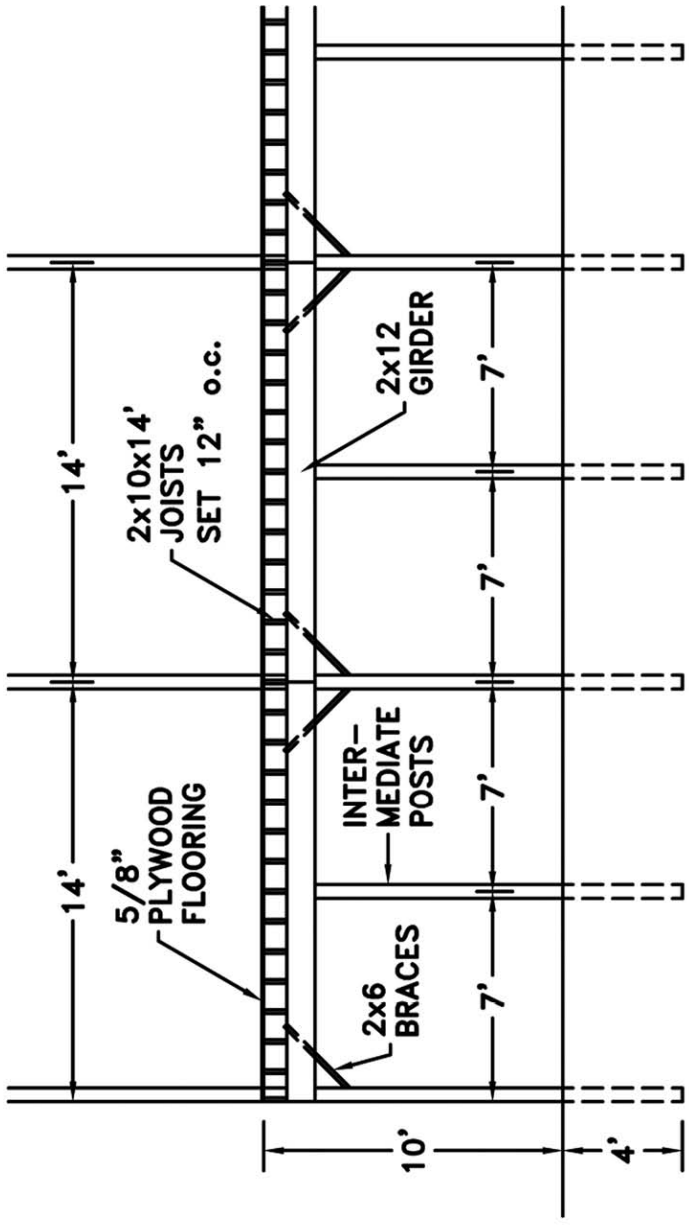
Partial Hayloft

- Cross Section



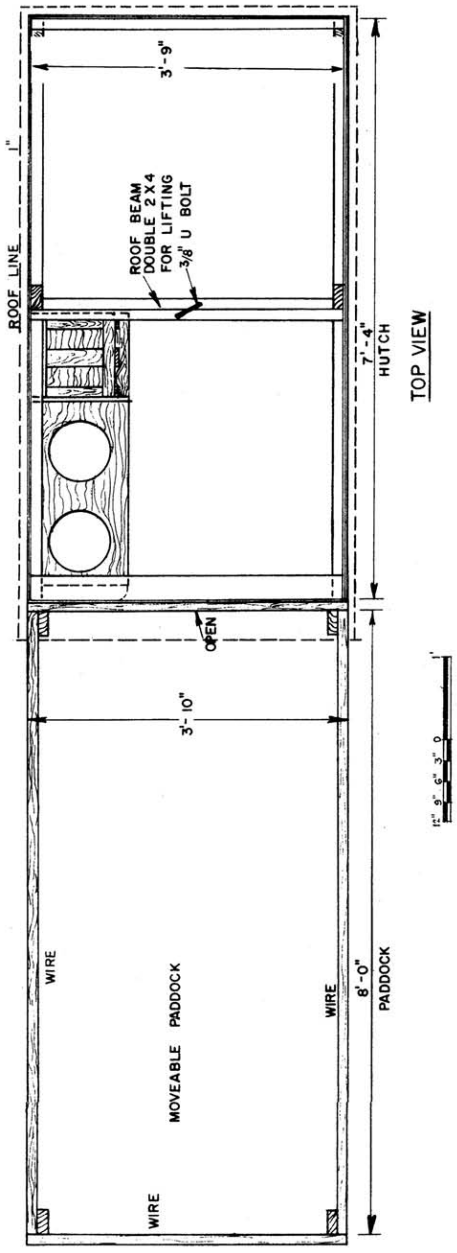
Partial Hayloft

- Loft Framing Detail

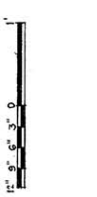


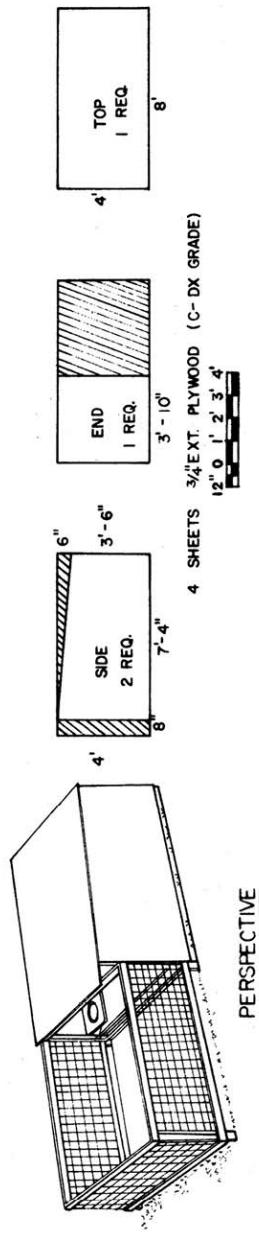
Calf Hutch with Moveable Paddock

• Top View • Perspective



TOP VIEW



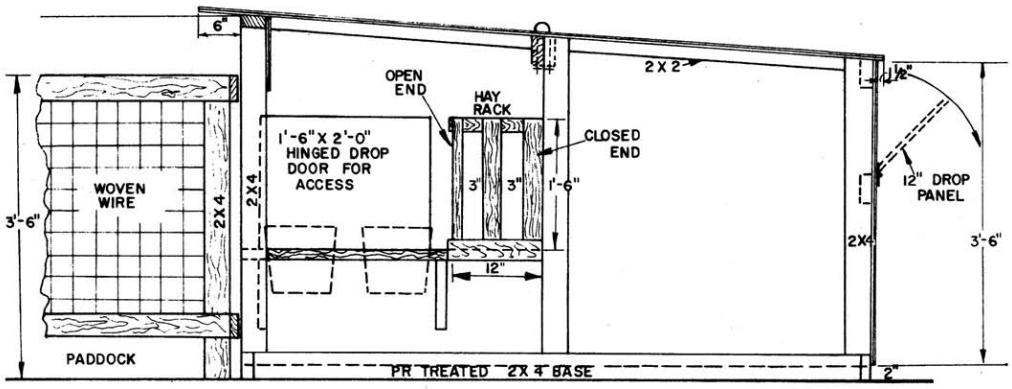


PERSPECTIVE

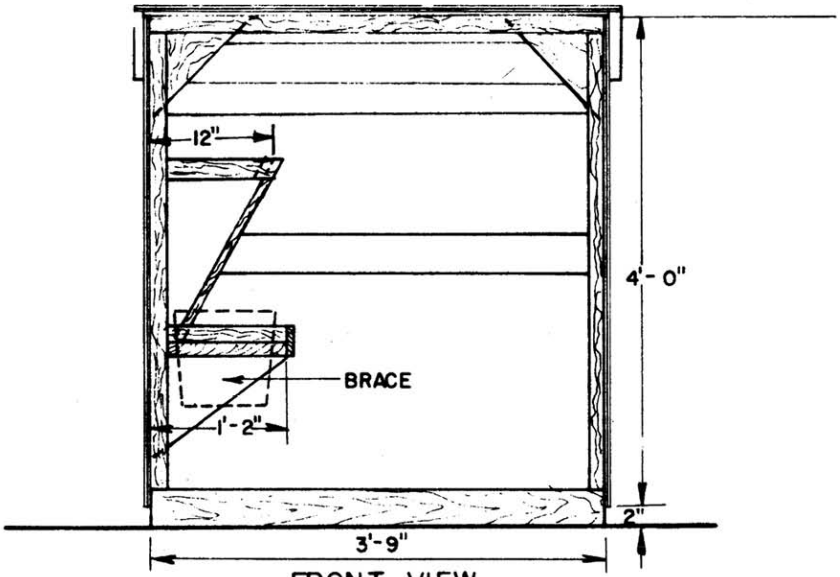
NOTE:
CONSULT LOCAL HEALTH AND BUILDING CODE
AUTHORITIES BEFORE STARTING CONSTRUCTION

Calf Hutch with Moveable Paddock

• Side View • Front View



SIDE VIEW
(SIDE COVERING OMITTED)



FRONT VIEW

LIST OF MATERIALS

(ALL SOUND QUALITY PLANED HARDWOOD LUMBER HAVING GOOD RESISTANCE TO DECAY)

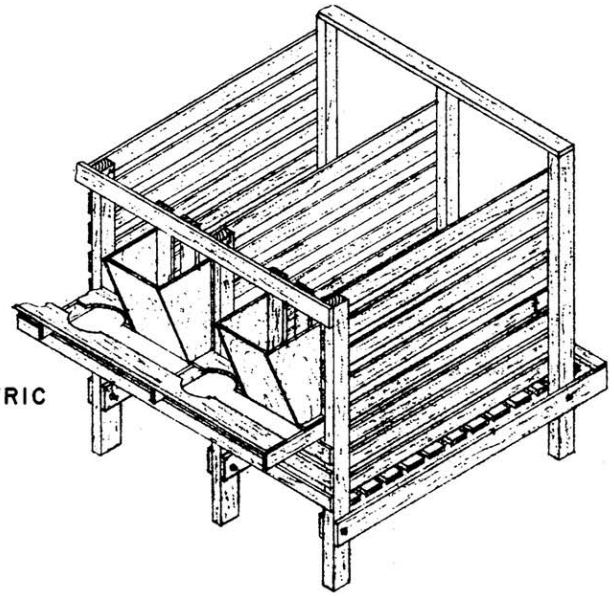
SIZE*	LENGTH	QUANTITY
3/4" X 2"	19-1/2"	1 PER STALL
3/4" X 2"	21-7/8"	1 PER STALL
3/4" X 2"	4'3"	2 PER STALL
3/4" X 3"	19-1/2"	1 PER STALL
3/4" X 3"	21-7/8"	10 PER STALL
3/4" X 3"	27"	2 PER STALL
3/4" X 3"	4'0"	7 PER STALL
3/4" X 3"	5'0"	1 PER STALL
3/4" X 4"	4'6"**	2 PER STALL
2" X 3"	4'3"	1 PER STALL
2" X 3"	4'0"	1 PER STALL
3/4" X 2"	12'	1 PER 6 STALLS
3/4" X 3"	12'	5 PER 6 STALLS
3/4" X 4"	12'	2 PER 6 STALLS
1/2" PLY OR 3/4" BD	10" X 19"	1 PER STALL
1/2" PLY.	12" X 16" SLOPED	2 PER STALL

SIZE*	LENGTH	QUANITITY
NAILS:	1-1/2" (COMMON OR HARDENED)	1/10 LB. PER STALL
	2" (COMMON OR HARDENED)	1/3 LB. PER STALL
BOLTS:	3/8" X 4" MACH.	2 PER STALL
WASHERS:	3/8" FLAT	4 PER STALL

* ALL WOOD SIZES "ACTUAL"

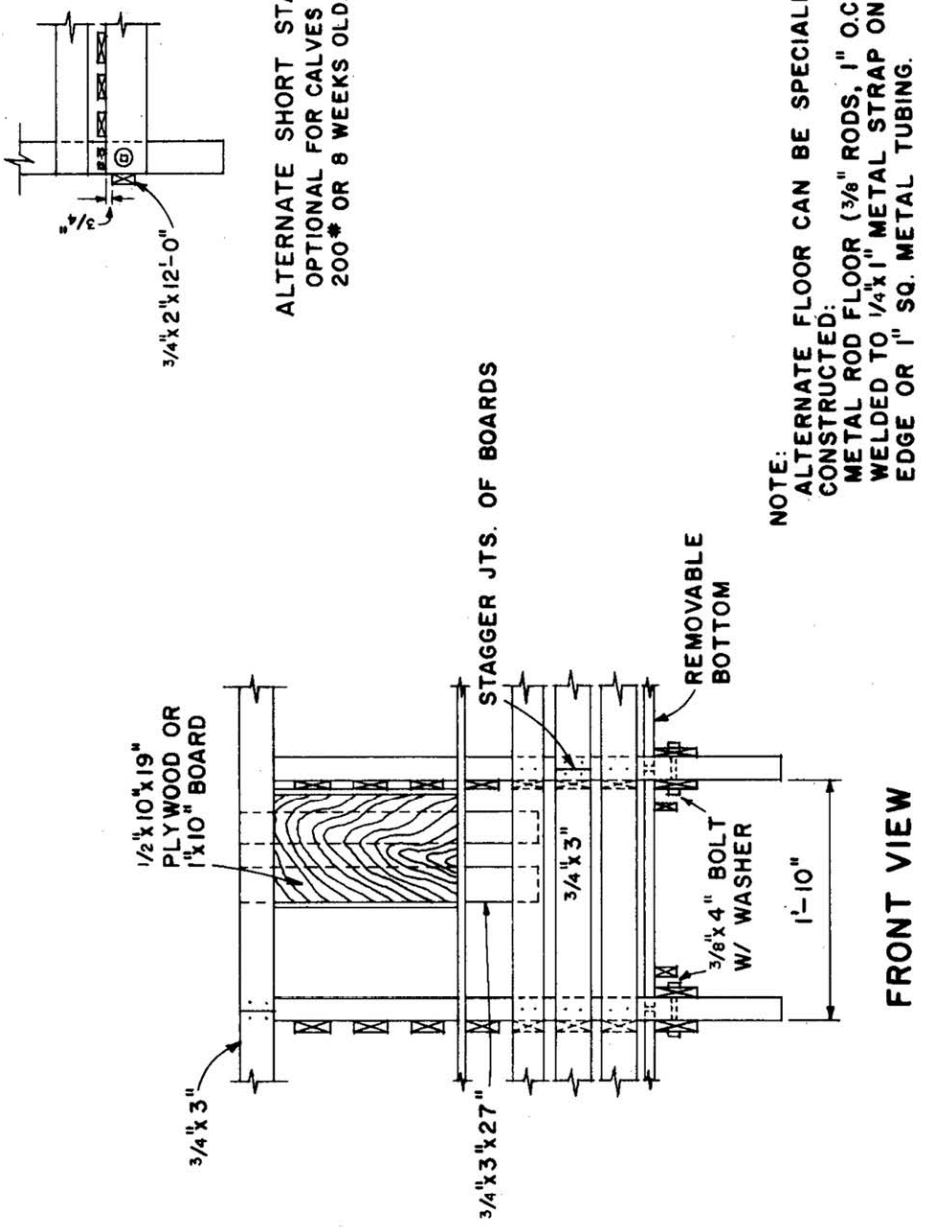
** 4'-6" FOR VEAL CALVES TO 300#, ONLY 4'-0" FOR CALVES TO 200#

ISOMETRIC



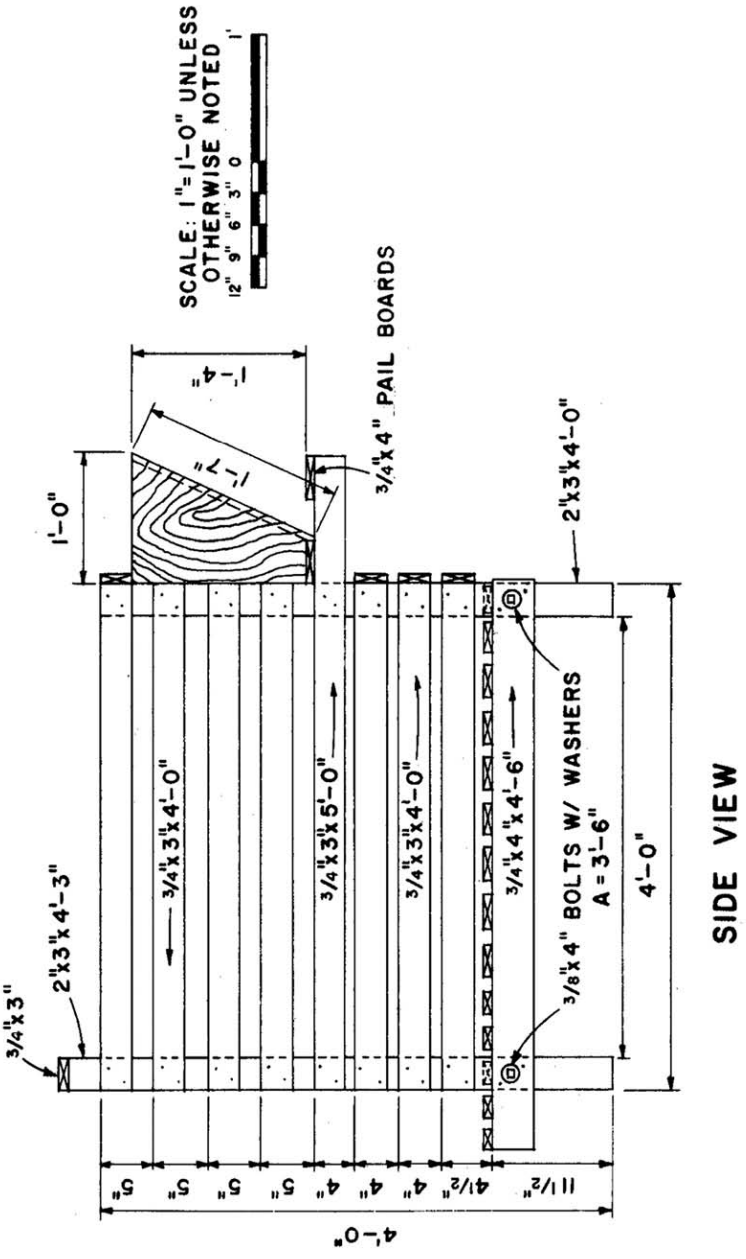
Elevated Wood Calf Stall

- Front View



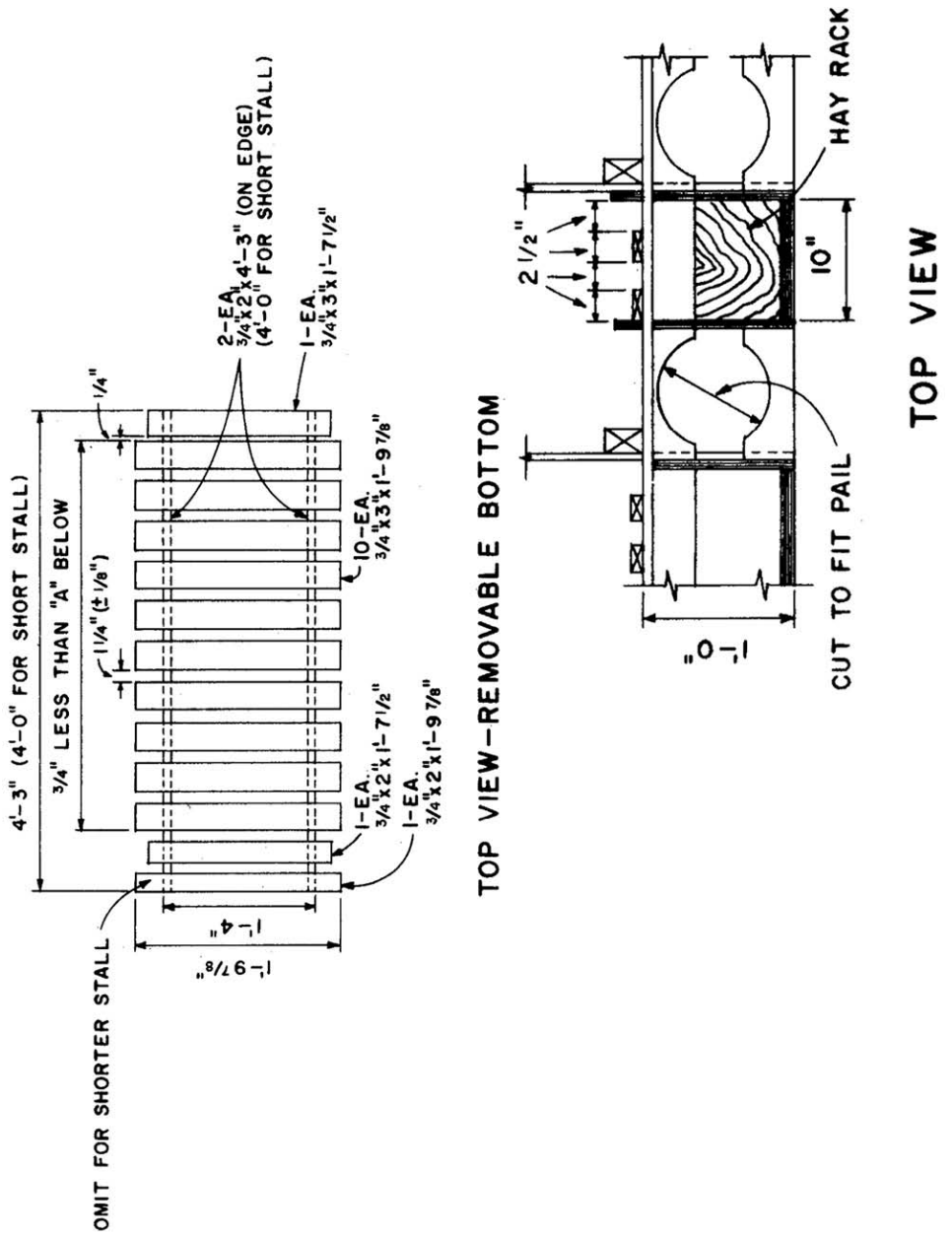
Elevated Wood Calf Stall

- Side View



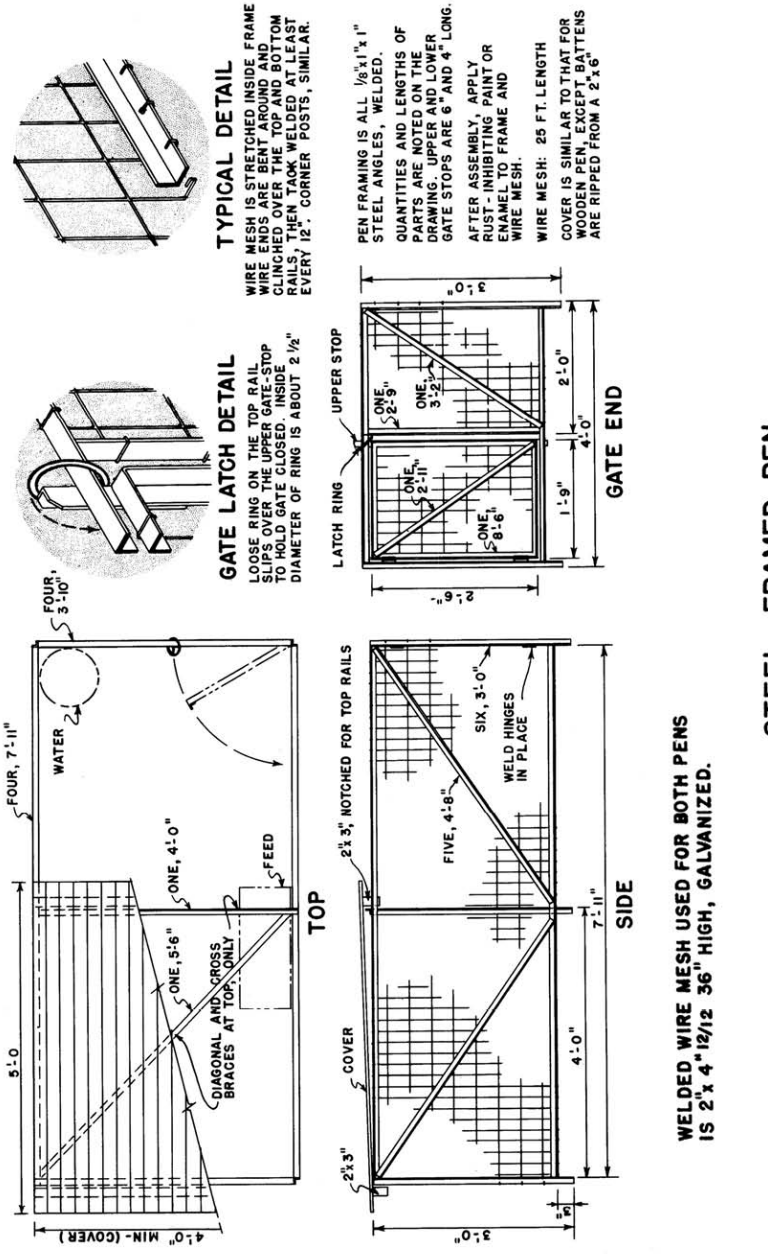
Elevated Wood Calf Stall

- Removeable Bottom–Top View



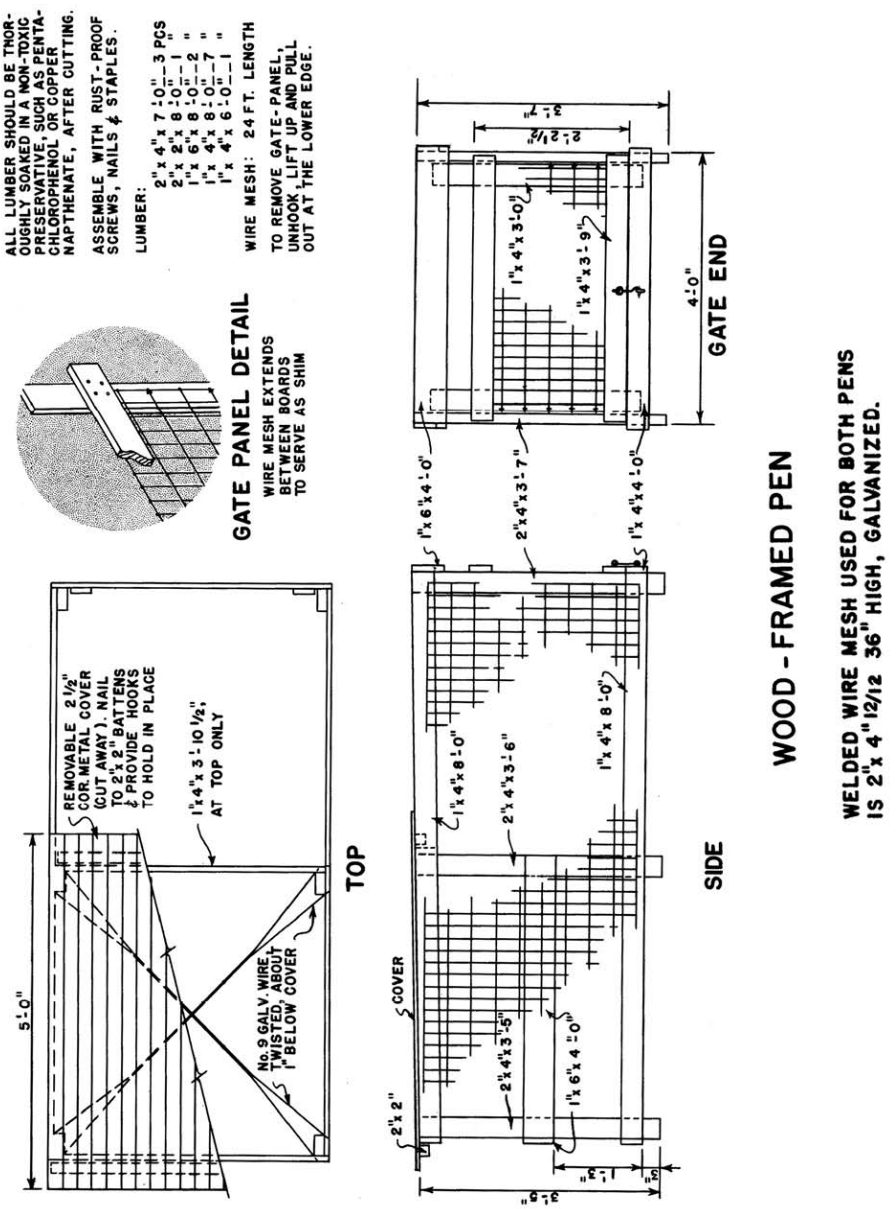
STEEL-FRAMED PORTABLE CALF PEN

• Top • Side • Gate End • Gate Latch Detail • Typical Detail


TYPICAL DETAIL
WIRE MESH IS STRETCHED INSIDE FRAME WIRE ENDS ARE BENT AROUND AND CLINCHED OVER THE TOP AND BOTTOM RAILS, THEN TACK WELDED AT LEAST EVERY 12". CORNER POSTS, SIMILAR.
GATE LATCH DETAIL
LOOSE RING ON THE TOP RAIL SLIPS OVER THE UPPER GATE STOP TO HOLD GATE CLOSED. INSIDE DIAMETER OF RING IS ABOUT 2 1/2"
PEN FRAMING IS ALL 1/8"x1"x1" STEEL ANGLES, WELDED.
QUANTITIES AND LENGTHS OF PARTS ARE NOTED ON THE DRAWING. UPPER AND LOWER GATE STOPS ARE 6" AND 4" LONG.
AFTER ASSEMBLY, APPLY RUST-INHIBITING PAINT OR ENAMEL TO FRAME AND WIRE MESH.
WIRE MESH: 25 FT. LENGTH
COVER IS SIMILAR TO THAT FOR WOODEN PEN, EXCEPT BATTENS ARE RIPPED FROM A 2"x6"
LATCH RING
UPPER STOP
ONE, 2'-9"
ONE, 3'-2"
ONE, 2'-11"
ONE, 8'-6"
1'-9"
2'-0"
4'-0"
GATE END
FOUR, 3'-10"
FOUR, 7'-11"
WATER
ONE, 4'-0"
FEED
ONE, 5'-6"
DIAGONAL AND CROSS BRACES AT TOP ONLY
5'-0
4'-0" MIN. (COVER)
TOP
2"x3", NOTCHED FOR TOP RAILS
FIVE, 4'-8"
SIX, 3'-0"
WELD HINGES IN PLACE
COVER
2"x3"
4'-0"
7'-11"
SIDE
STEEL-FRAMED PEN
WELDED WIRE MESH USED FOR BOTH PENS IS 2"x4" 12/12 36" HIGH, GALVANIZED.

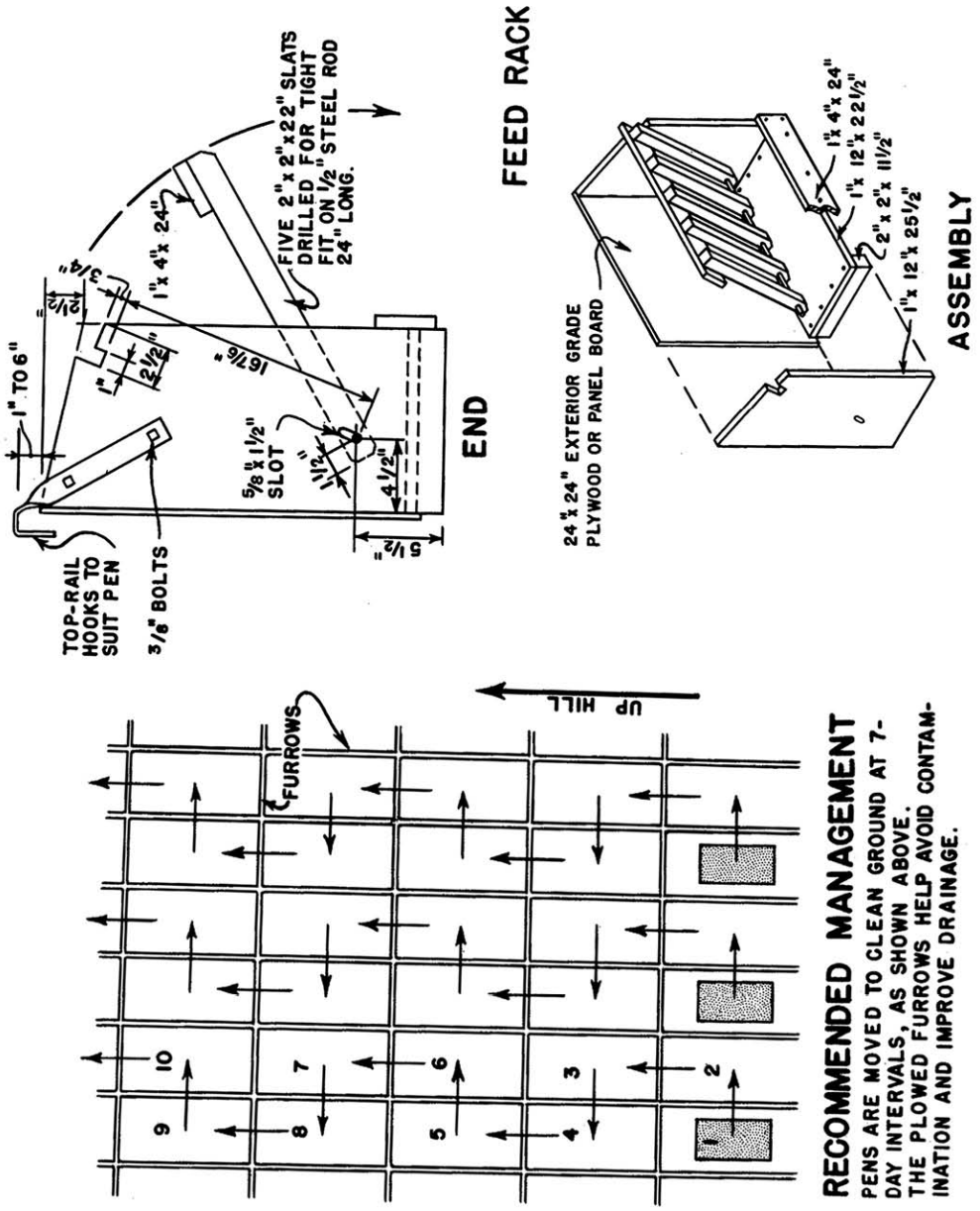
WOOD-FRAMED PORTABLE CALF PEN

• Top • Side • Gate End • Gate Panel Detail


ALL LUMBER SHOULD BE THOROUGHLY SOAKED IN A NON-TOXIC PRESERVATIVE, SUCH AS PENTACHLOROPHENOL OR COPPER NAPTHENATE, AFTER CUTTING.
ASSEMBLE WITH RUST-PROOF SCREWS, NAILS & STAPLES.
LUMBER:
2" x 4" x 7'-0" — 3 PCS
2" x 2" x 8'-0" — 1 "
1" x 6" x 8'-0" — 2 "
1" x 4" x 8'-0" — 7 "
1" x 4" x 6'-0" — 1 "
WIRE MESH: 24 FT. LENGTH
TO REMOVE GATE-PANEL, UNHOOK, LIFT UP AND PULL OUT AT THE LOWER EDGE.
GATE PANEL DETAIL
WIRE MESH EXTENDS BETWEEN BOARDS TO SERVE AS SHIM
REMOVABLE 2½" COR. METAL COVER (CUT AWAY). NAIL TO 2"x 2" BATTENS & PROVIDE HOOKS TO HOLD IN PLACE
1"x 4" x 3'-10½"; AT TOP ONLY
No. 9 GALV. WIRE TWISTED, ABOUT 1" BELOW COVER
5'-0"
TOP
1"x 6"x 4'-0"
2"x 4"x 3'-7"
1"x 4"x 4'-0"
1"x 4"x 3'-9"
1"x 4"x 3'-0"
4'-0"
GATE END
1"x 4"x 8'-0"
2"x 4"x 3'-6"
1"x 4"x 8'-0"
COVER
2"x 2"
2"x 4"x 3'-5"
1"x 6"x 4'-0"
SIDE
WOOD-FRAMED PEN
WELDED WIRE MESH USED FOR BOTH PENS IS 2"x 4" 12/12 36" HIGH, GALVANIZED.

Feed Rack for Portable Calf Pen

• Recommended Management • End • Assembly



9X4X4 Cattle Breeding Rack

• List of Materials • Perspective & End Views

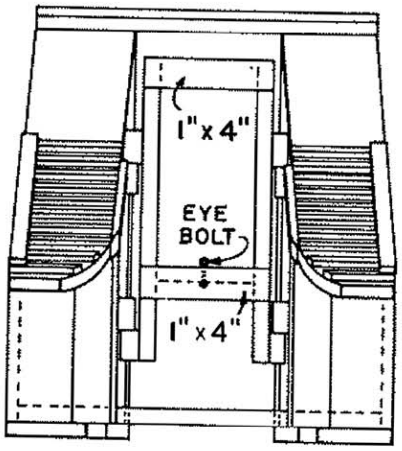
LIST OF MATERIALS

(2) 2" X 12" X 10'-0" BASES
(2) 2" X 12" X 10'-0" UPRIGHTS
(1) 2" X 8" X 6'-0" UPRIGHT
(1) 2" X 4" X 12'-0" BOTTOM TIE
(2) 2" X 6" X 10'-0" DIAGONAL BRACES
(2) 2" X 4" X 12'-0" EXTENSION BARS
(2) 2" X 12" X 10'-0" FOOT RESTS
(1) 2" X 4" X 8'-0" END TIE
(1) 2" X 4" X 10'-0" YOKE
(1) 1" X 4" X 6'-0" YOKE
(1) 1" X 3" X 8'-0" FOOT GUARD
30 LIN. FT. 1" X 2" CLEATS
6 LBS. 20 D NAILS
2 LBS. 10 D NAILS
(1) 3/4" EYE BOLT 4" LONG 1-1/2" EYE

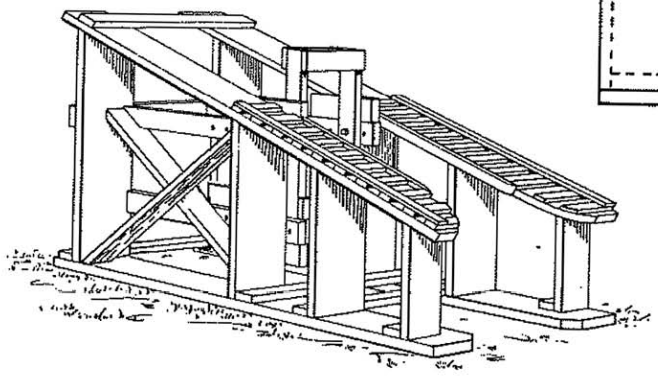
NOTE:

THE YOKE MAY BE MOVED FORWARD OR BACK TO SUIT SIZE OF ANIMAL.

ALL WOOD SHOULD BE TREATED WITH PRESERVATIVE.



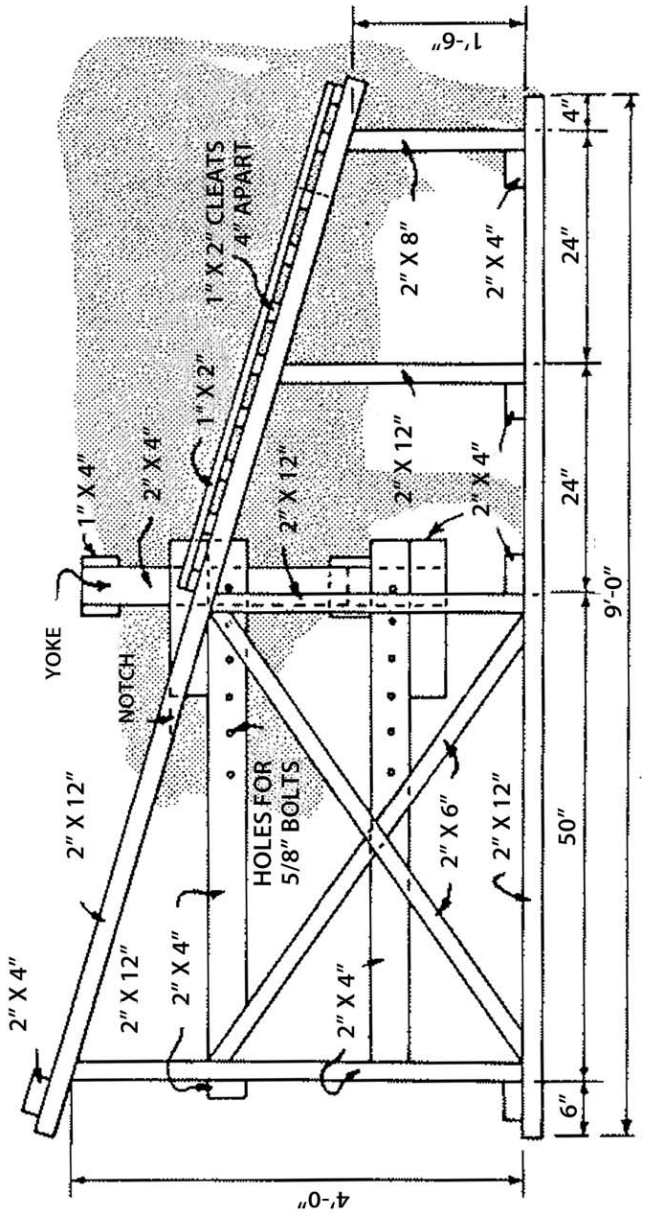
END VIEW



PERSPECTIVE

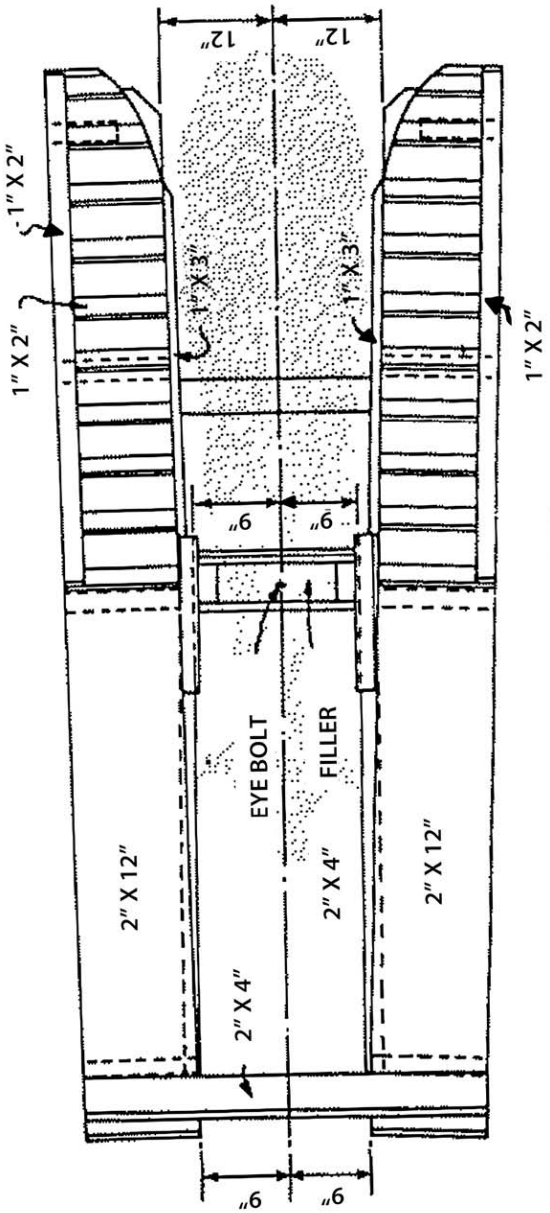
9x4x4 Cattle Breeding Rack

- Elevation



9X4X4 CATTLE BREEDING RACK

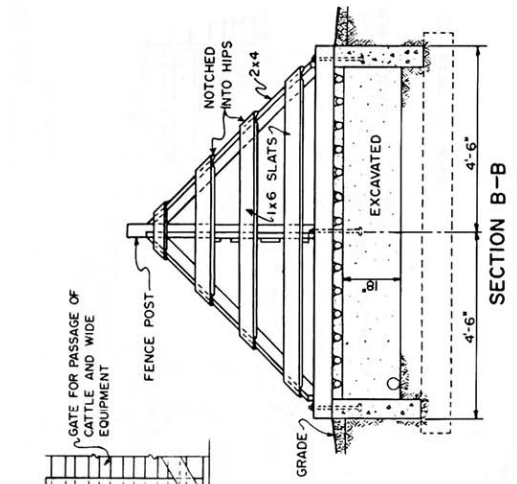
- Top View



TOP VIEW

CATTLE GUARD I

• Bill of Materials • Plan • Section A-A • Section B-B



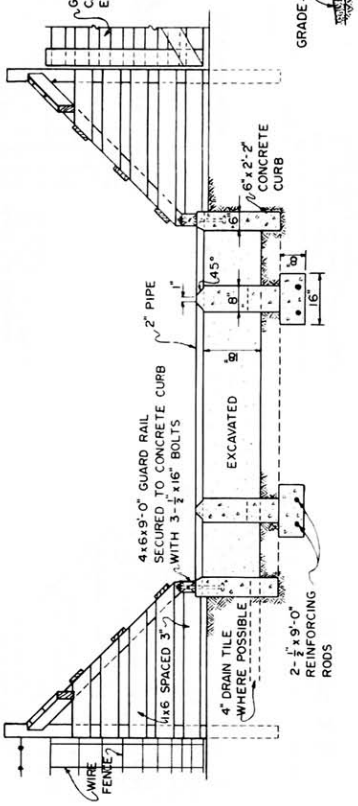
BILL OF MATERIALS

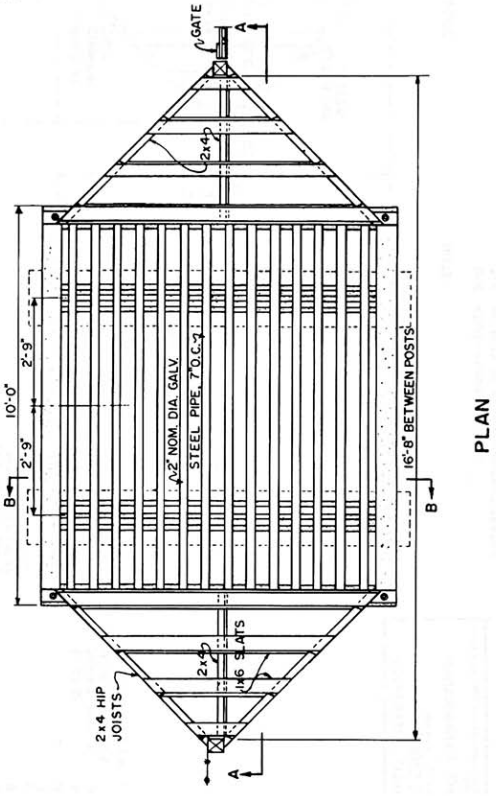
CONCRETE AND STEEL

LUMBER		
FRAMING:	1-PCS	2 X 4 X 12'-0"
	2-PCS	2 X 4 X 14'-0"
SLATS:	6-PCS	1 X 6 X 12'-0"
GUARD RAILS:	2-PCS	4 X 6 X 9'-0"
CONCRETE	2-3/4 CU. YDS. (1:3:5 MIXTURE)	
CEMENT:	13 SACKS	
SAND:	1.4 CU. YDS.	
AGGREGATE:	2.35 CU. YDS.	
MISCELLANEOUS		
PIPES:	14-PCS	2" NOM. DIA. EXTRA STRONG GALV. STEEL PIPE OR RAILS 10'-0" LONG
ANCHOR BOLTS:	6-1/2" X 16"	
REINF. RODS:	4-1/2" X 9'-0"	

NOTE: A WIDE GATE ADJACENT TO GUARD IS SUGGESTED FOR PASSAGE OF EXTRA WIDE EQUIPMENT AND LIVESTOCK.

ALL WOOD TO BE TREATED WITH PRESERVATIVE.





CATTLE GUARD II

• Bill of Materials • Plan

BILLS OF MATERIAL

CONCRETE AND WOOD

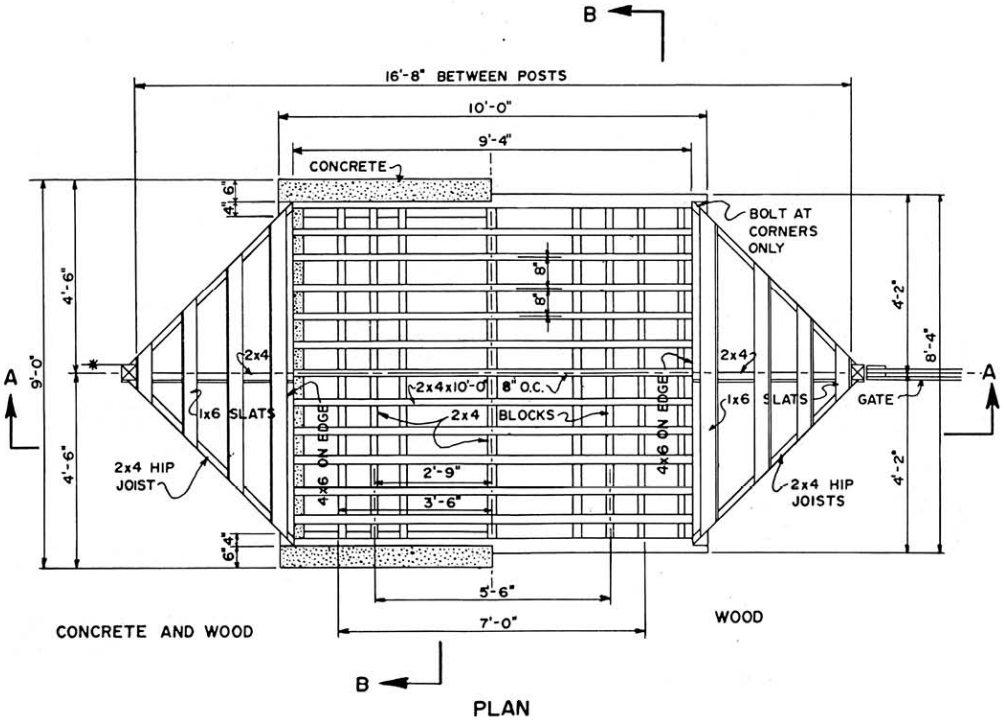
LUMBER	
FENCE POSTS:	2-PCS 4x4x7'-0"
FRAMING:	3-PCS 2x12x10'-0"
	7-PCS 2x12x8'-0"
	13-PCS 2x4x10'-0"
	2-PCS 2x4x9'-0"
	3-PCS 2x4x8'-0"
	6-PCS 2x4x6'-0"
SLATS:	9-PCS 1x6x8'-0"
GUARD RAILS:	2-PCS 4x6x8'-0"
CONCRETE	$2\frac{1}{2}$ CU. YDS. (1:3:5 MIXTURE)
CEMENT:	12 SACKS
SAND:	1.25 CU. YDS.
AGGREGATE:	2.13 CU. YDS.
MISCELLANEOUS	
ANCHOR BOLTS:	FOUR $\frac{1}{2}$"x12" GALV.
REINF. RODS:	FOUR $\frac{1}{2}$" x 9'-9"
	TWO $\frac{1}{2}$" x 8'-9"

WOOD

LUMBER	
FENCE POSTS:	2-PCS 4x4x7'-0"
FRAMING:	2-PCS 12x12x9'-0"
	2-PCS 4x4x10'-0"
	3-PCS 2x12x10'-0"
	9-PCS 2x12x8'-0"
	11-PCS 2x4x10'-0"
	3-PCS 2x4x8'-0"
	6-PCS 2x4x6'-0"
SLATS:	9-PCS 1x6x8'-0"
GUARD RAILS:	2-PCS 4x6x8'-0"
MISCELLANEOUS	
ANCHOR BOLTS:	FOUR $\frac{1}{2}$"x12" GALV.

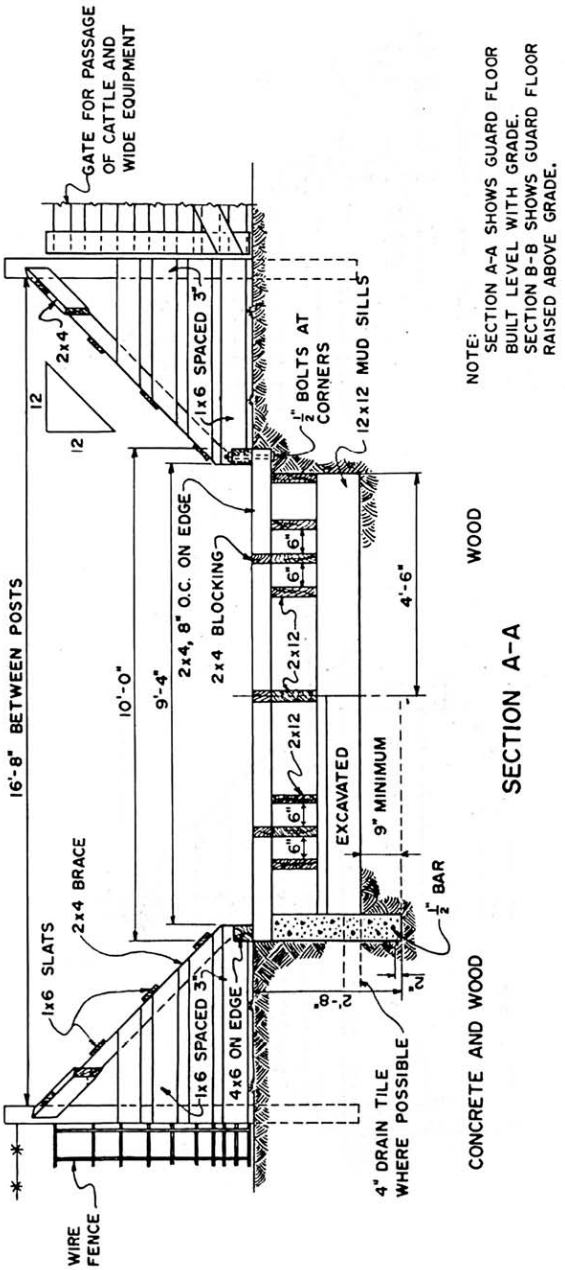
NOTE:

USE ROUGH-SAWN LUMBER.
ALL WOOD IS TO BE PRESSURE TREATED WITH PRESERVATIVE.



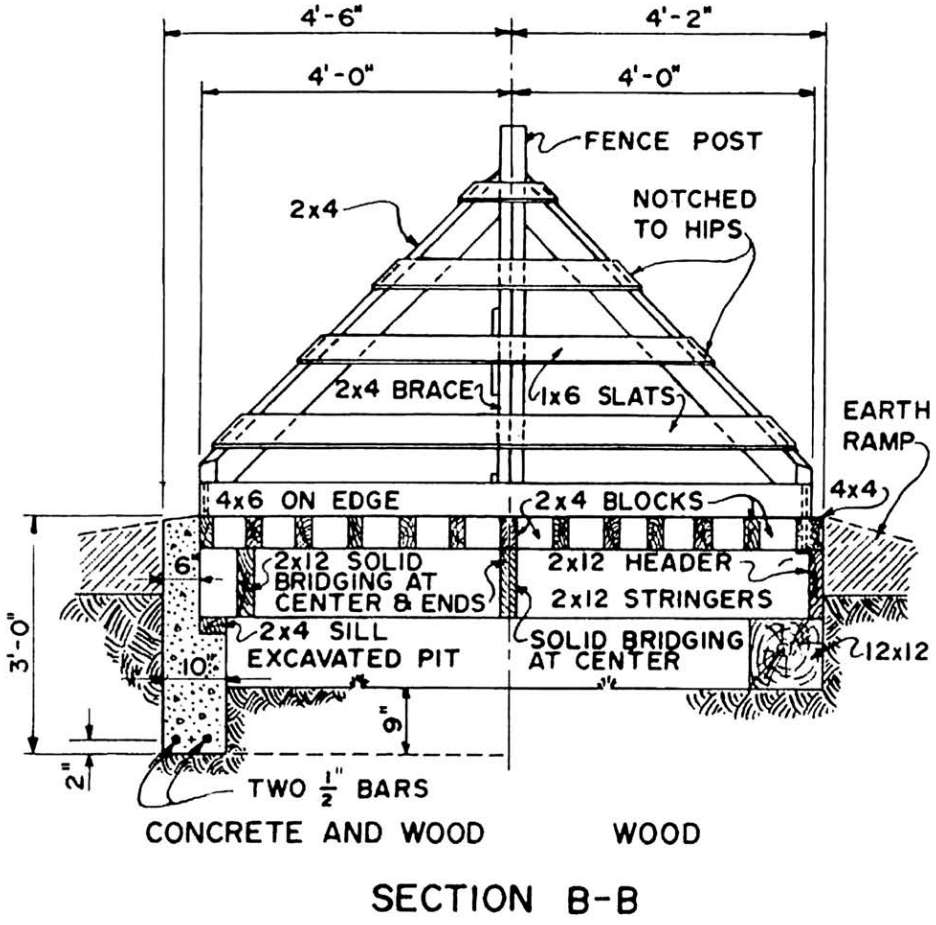
CATTLE GUARD II

- Section A-A



CATTLE GUARD II

- Section B-B



SECTION B-B

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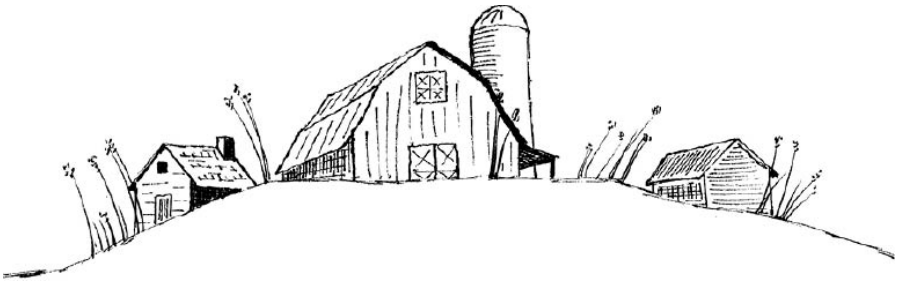


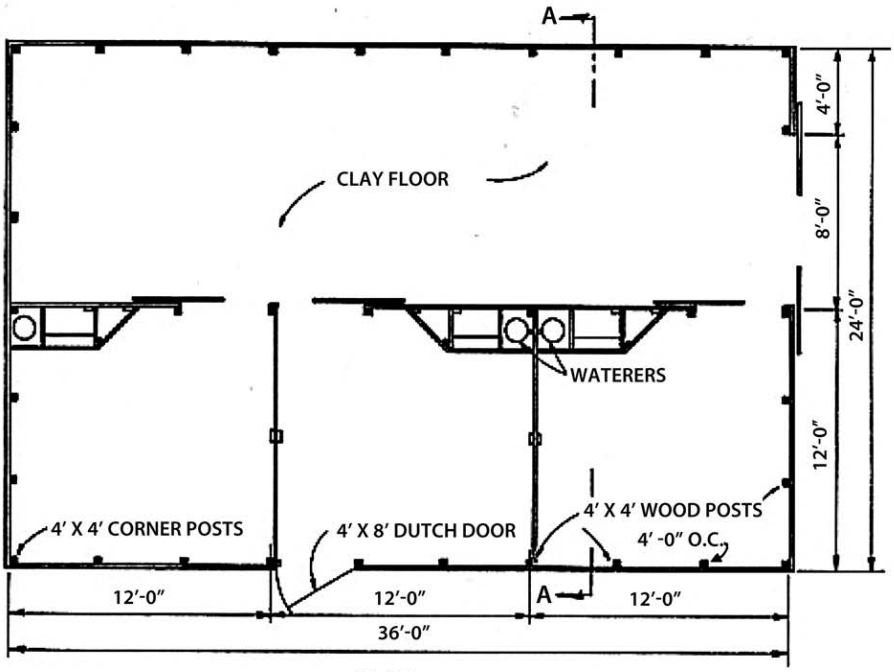
Chapter 3: Horse Barn & Trailer

Plans Include:

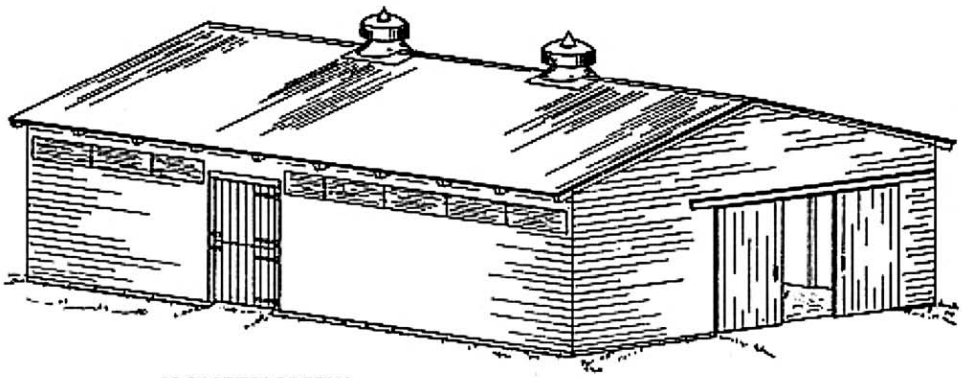
- 24x36 Three-Stall Horse Barn
- 2 Horse Trailer with Tandem Axle

24x36 Three-Stall Horse Barn

• Plan • Isometric View



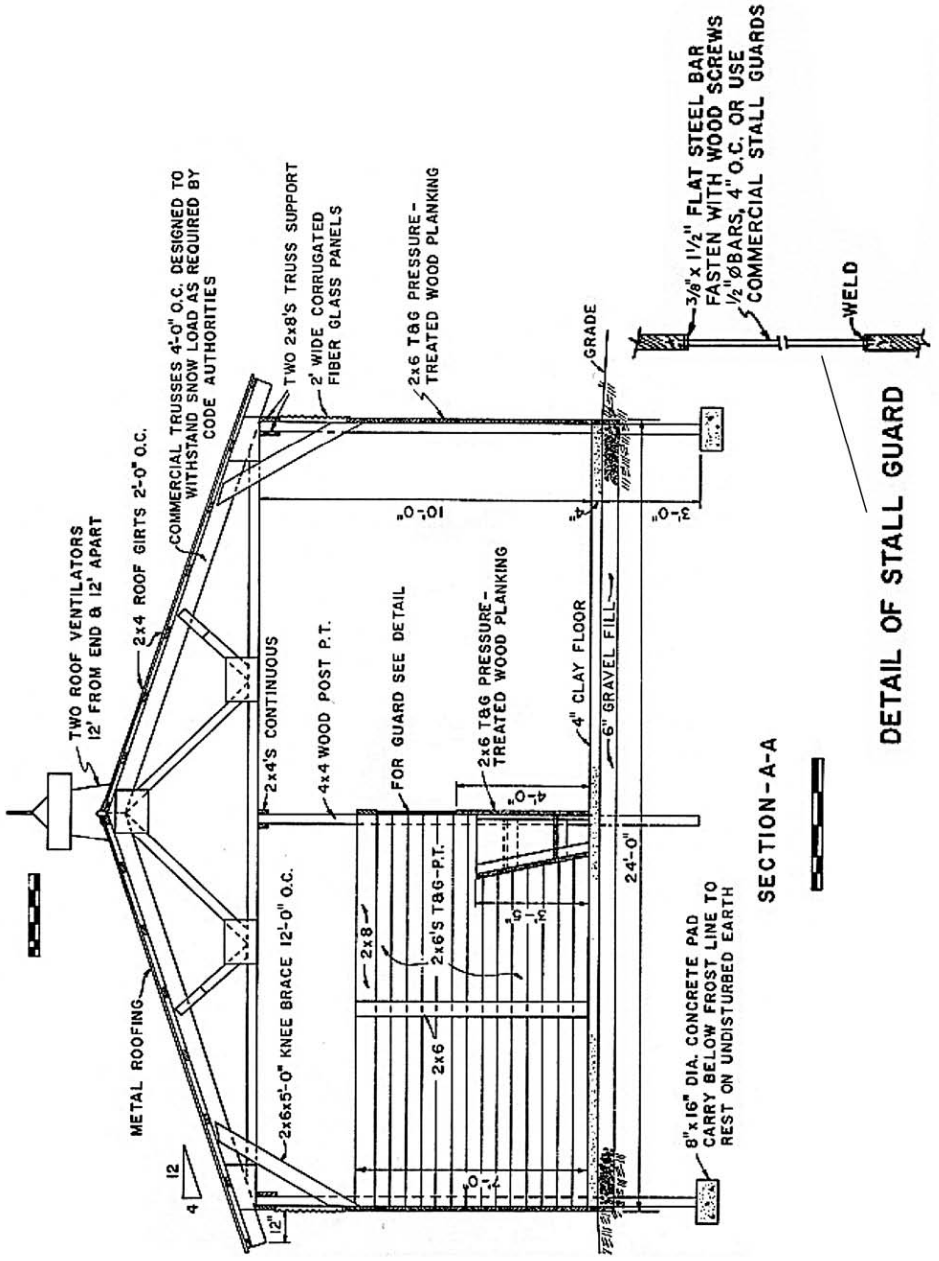
PLAN



ISOMETRIC VIEW

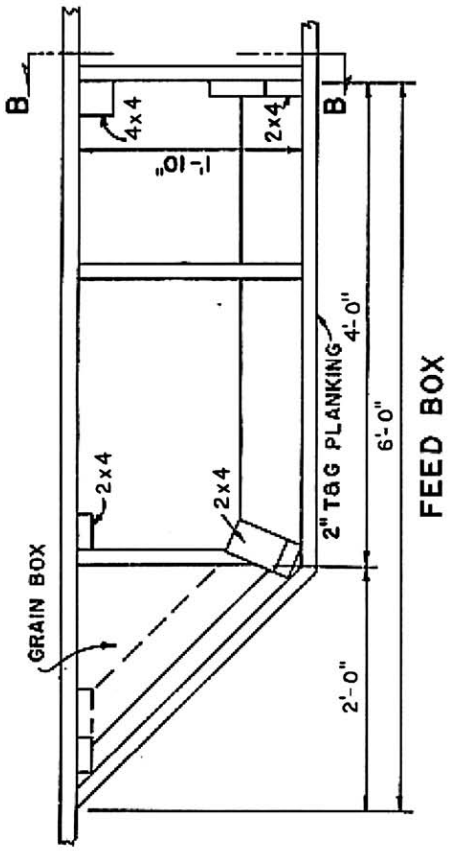
24x36 Three-Stall Horse Barn

• Section A-A • Detail of Stall Guard

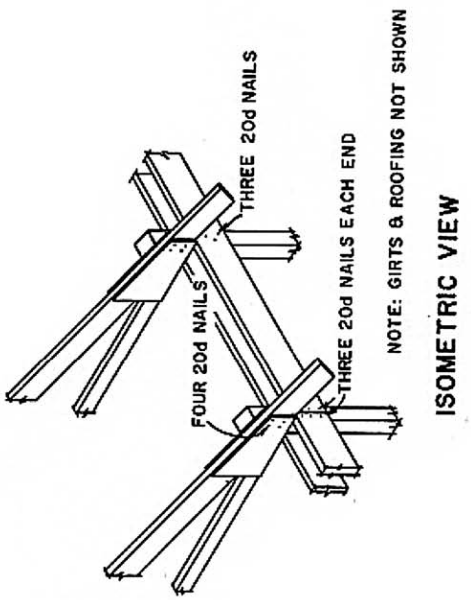

TWO ROOF VENTILATORS 12' FROM END & 12' APART
2x4 ROOF GIRTS 2'-0" O.C.
COMMERCIAL TRUSSES 4'-0" O.C. DESIGNED TO WITHSTAND SNOW LOAD AS REQUIRED BY CODE AUTHORITIES
TWO 2x8'S TRUSS SUPPORT
2' WIDE CORRUGATED FIBER GLASS PANELS
2x6 T&G PRESSURE-TREATED WOOD PLANKING
GRADE
3/8"x 1½" FLAT STEEL BAR FASTEN WITH WOOD SCREWS ½"ØBARS, 4" O.C. OR USE COMMERCIAL STALL GUARDS
WELD
2x4'S CONTINUOUS
4x4 WOOD POST P.T.
FOR GUARD SEE DETAIL
2x6 T&G PRESSURE-TREATED WOOD PLANKING
4" CLAY FLOOR
6" GRAVEL FILL
METAL ROOFING
2x6x5'-0" KNEE BRACE 12'-0" O.C.
2x8
2x6'S T&G-P.T.
2x6
24'-0"
8"x16" DIA. CONCRETE PAD CARRY BELOW FROST LINE TO REST ON UNDISTURBED EARTH
12
4
SECTION-A-A
DETAIL OF STALL GUARD

24x36 Three-Stall Horse Barn

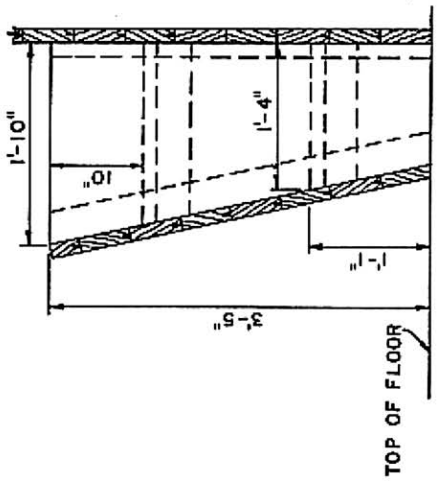
• Feed Box • Isometric View • Section B-B



FEED BOX



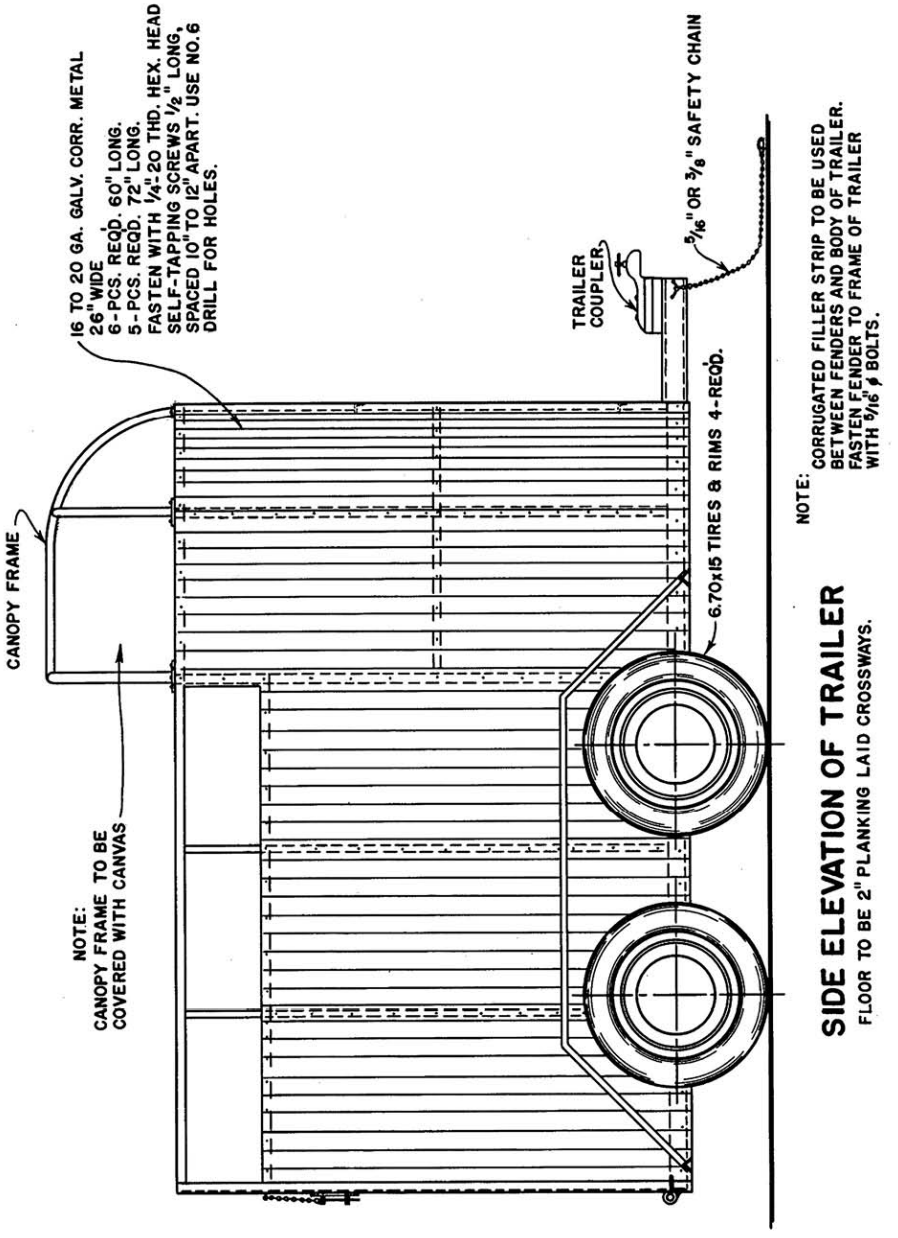
ISOMETRIC VIEW



SECTION B-B

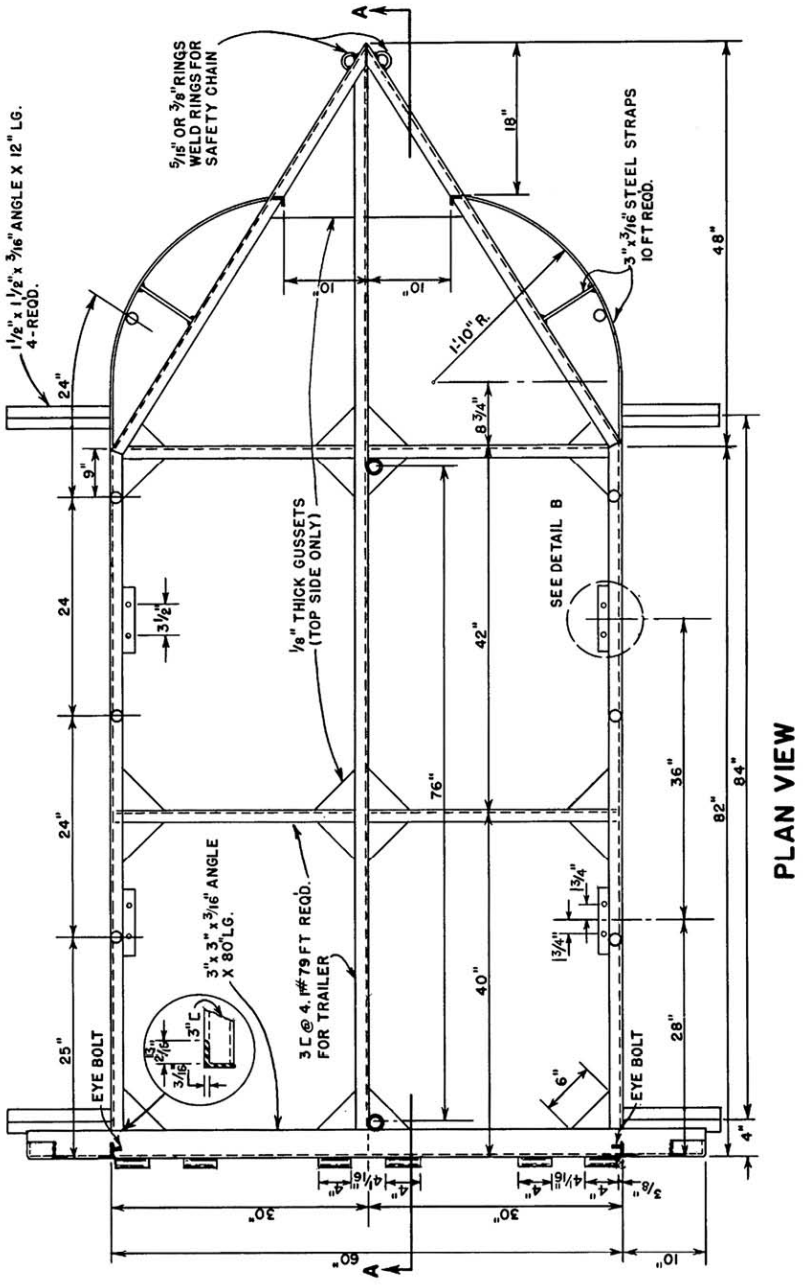
2 Horse Trailer with Tandem Axle

- Side Elevation of Trailer


16 TO 20 GA. GALV. CORR. METAL
26" WIDE
6-PCS. REQD. 60" LONG.
5-PCS. REQD. 72" LONG.
FASTEN WITH 1/4"-20 THD. HEX. HEAD
SELF-TAPPING SCREWS 1/2" LONG,
SPACED 10" TO 12" APART. USE NO. 6
DRILL FOR HOLES.
TRAILER COUPLER
5/16" OR 3/8" SAFETY CHAIN
CANOPY FRAME
6.70x15 TIRES & RIMS 4-REQD.
NOTE:
CANOPY FRAME TO BE
COVERED WITH CANVAS
NOTE:
CORRUGATED FILLER STRIP TO BE USED
BETWEEN FENDERS AND BODY OF TRAILER.
FASTEN FENDER TO FRAME OF TRAILER
WITH 5/16" ϕ BOLTS.
SIDE ELEVATION OF TRAILER
FLOOR TO BE 2" PLANKING LAID CROSSWAYS.

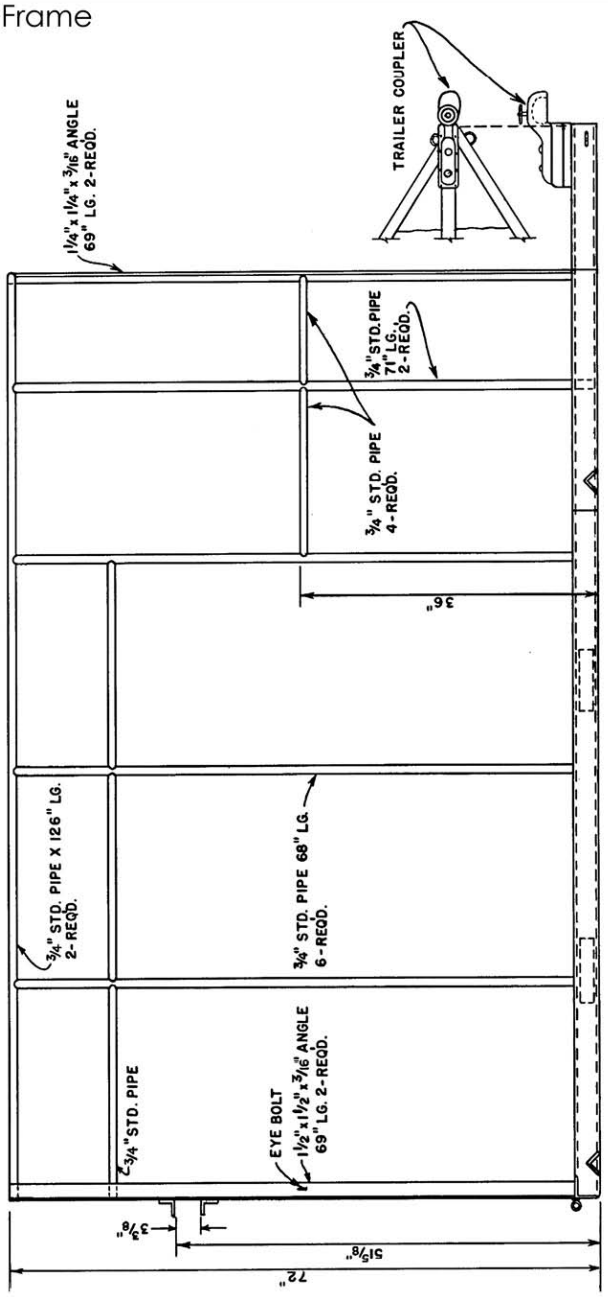
2 Horse Trailer with Tandem Axle

- Plan



2 Horse Trailer with Tandem Axle

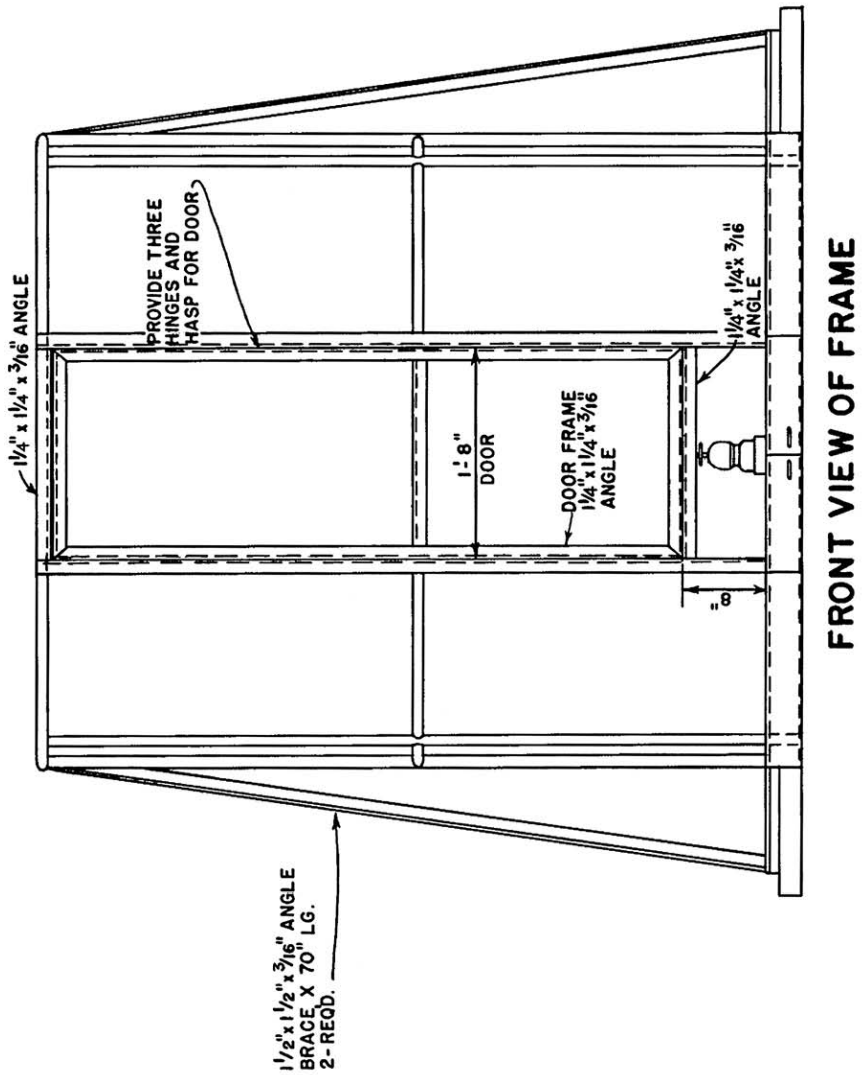
- Side View of Frame


TRAILER COUPLER
1¼" x 1¼" x 3/16" ANGLE 69" LG. 2-REQD.
¾" STD. PIPE 71" LG. 2-REQD.
¾" STD. PIPE 4-REQD.
36"
¾" STD. PIPE X 126" LG. 2-REQD.
¾" STD. PIPE 68" LG. 6-REQD.
¾" STD. PIPE
EYE BOLT
1½" x 1½" x 3/16" ANGLE 69" LG. 2-REQD.
3⅜"
51⅝"
72"

SIDE VIEW OF FRAME

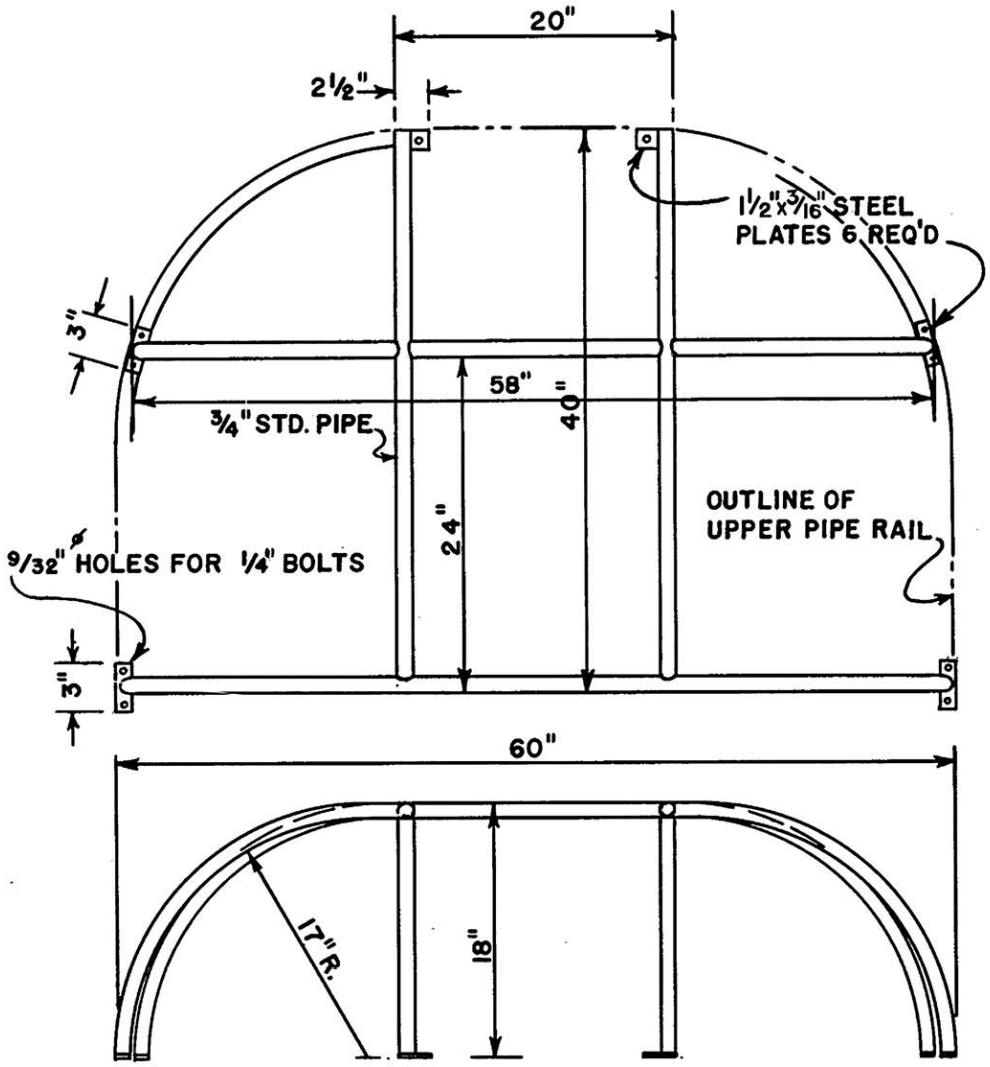
2 Horse Trailer with Tandem Axle

- Front View of Frame


1¼" x 1¼" x 3/16" ANGLE
PROVIDE THREE HINGES AND HASP FOR DOOR
1'-8" DOOR
DOOR FRAME 1¼" x 1¼" x 3/16" ANGLE
1¼" x 1¼" x 3/16" ANGLE
8"
1½" x 1½" x 3/16" ANGLE BRACE, X 70" LG. 2- REQD.
FRONT VIEW OF FRAME

2 Horse Trailer with Tandem Axle

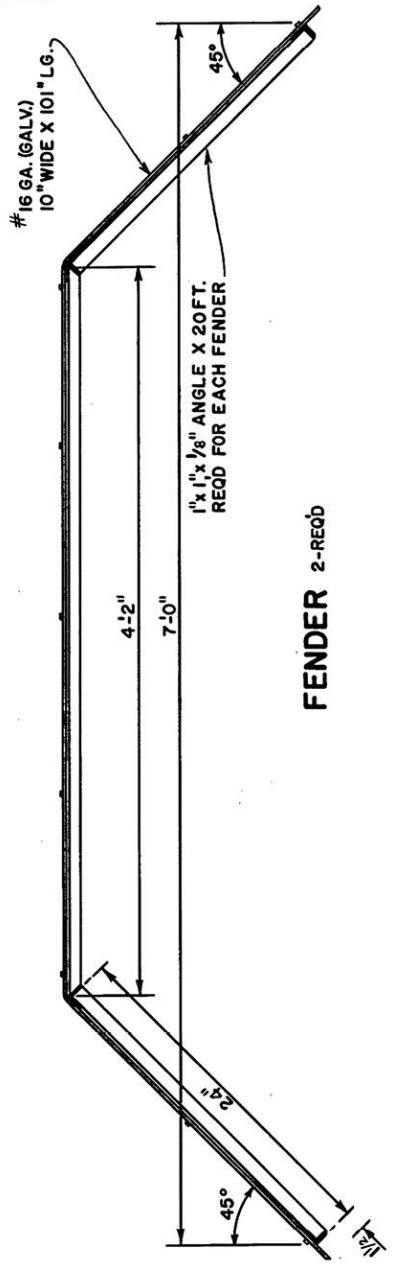
- Canopy Frame



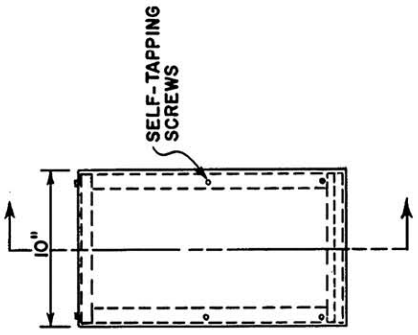
CANOPY FRAME 1-REQ'D

2 Horse Trailer with Tandem Axle

- Fender

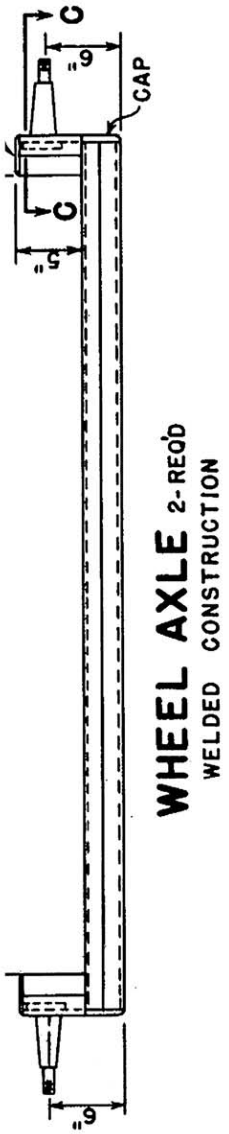


FENDER 2-REQD

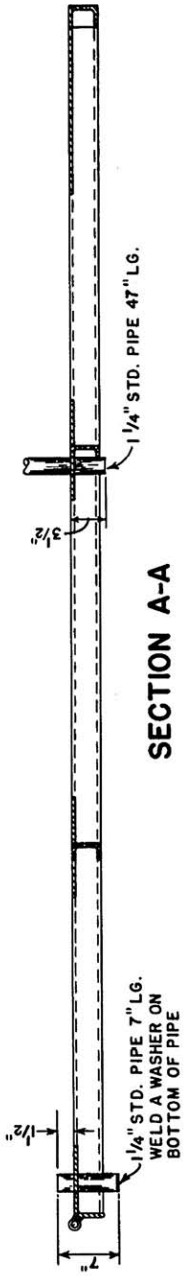


2 Horse Trailer with Tandem Axle

• Wheel Axle • Section A-A



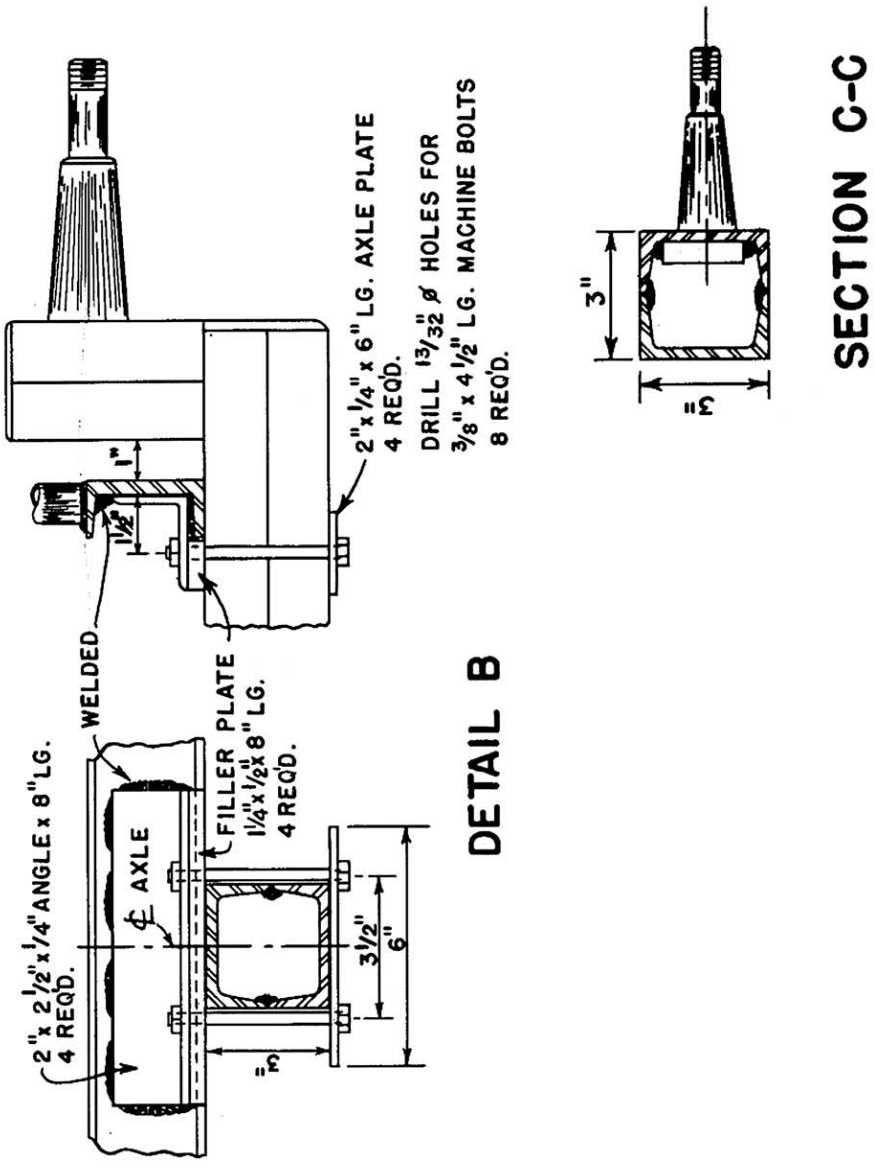
WHEEL AXLE 2-REQ'D
WELDED CONSTRUCTION



SECTION A-A

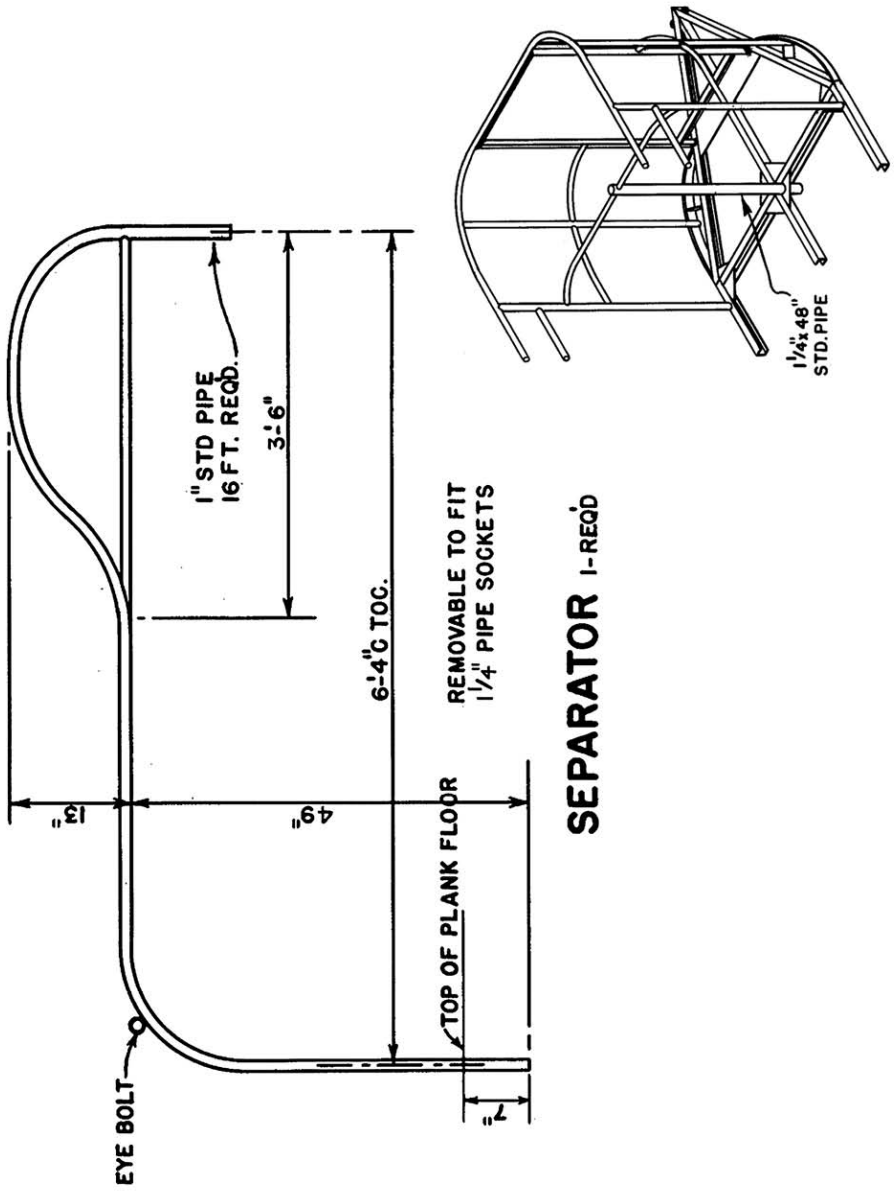
2 Horse Trailer with Tandem Axle

• Detail B • Section C-C



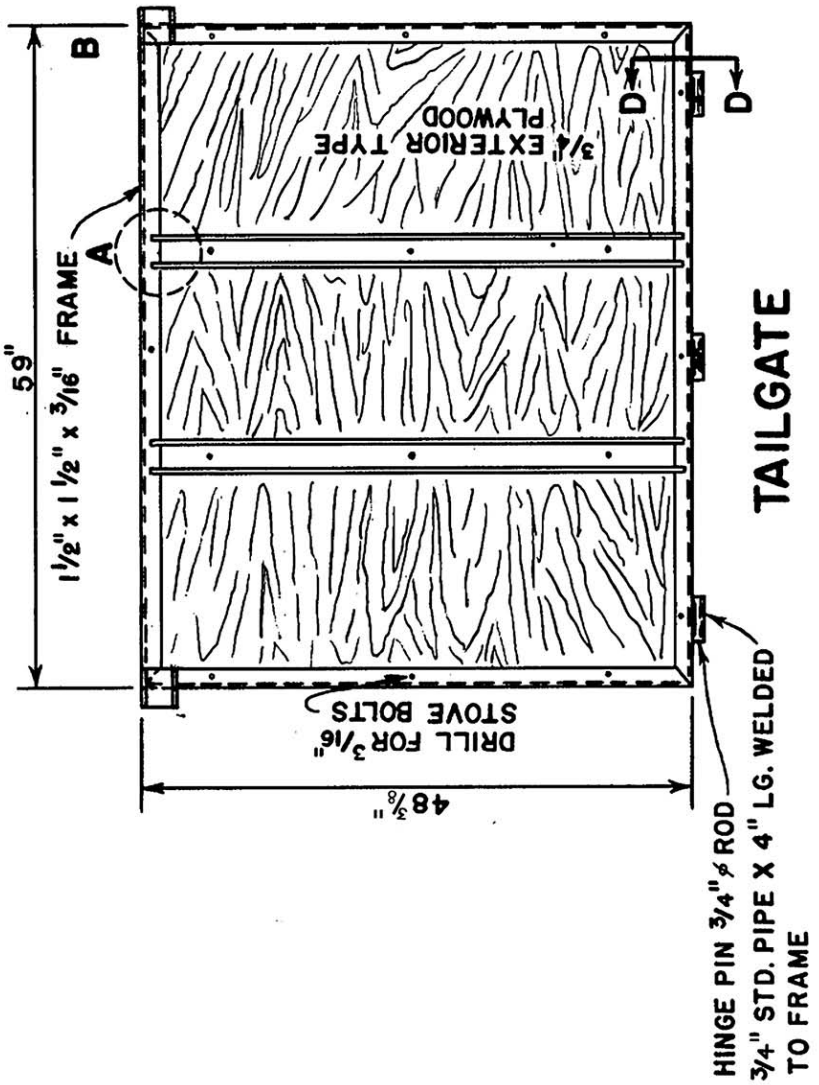
2 Horse Trailer with Tandem Axle

- Seperator



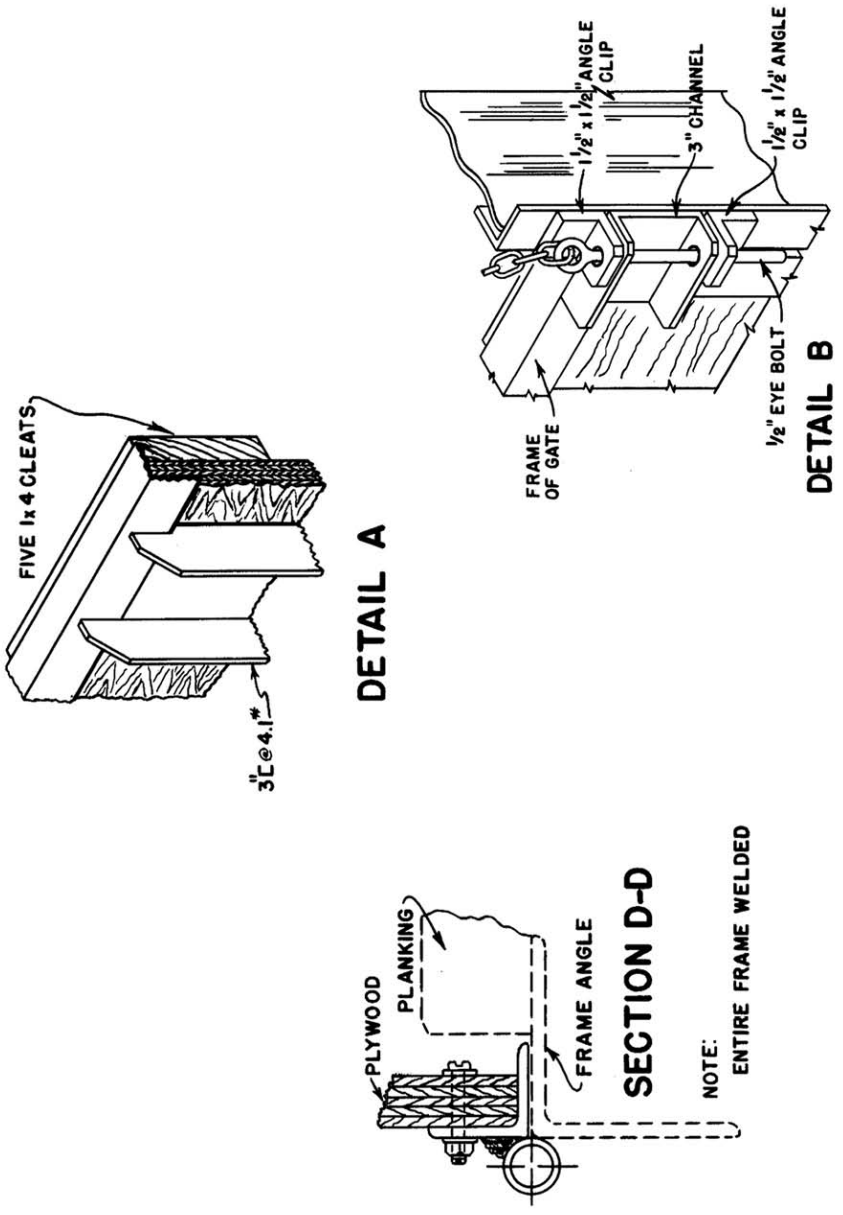
2 Horse Trailer with Tandem Axle

- Tailgate



2 Horse Trailer with Tandem Axle

- Tailgate Details A, B, & Section D-D



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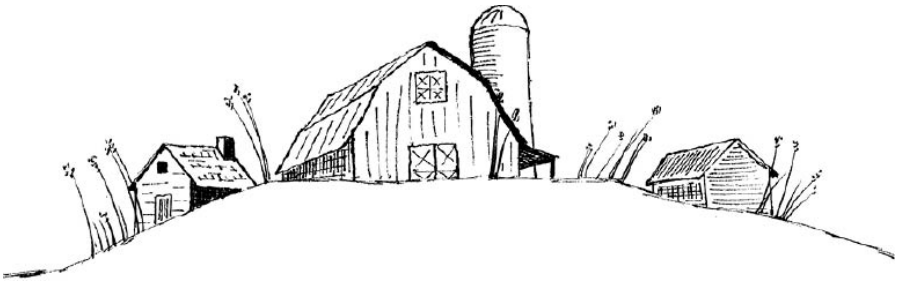


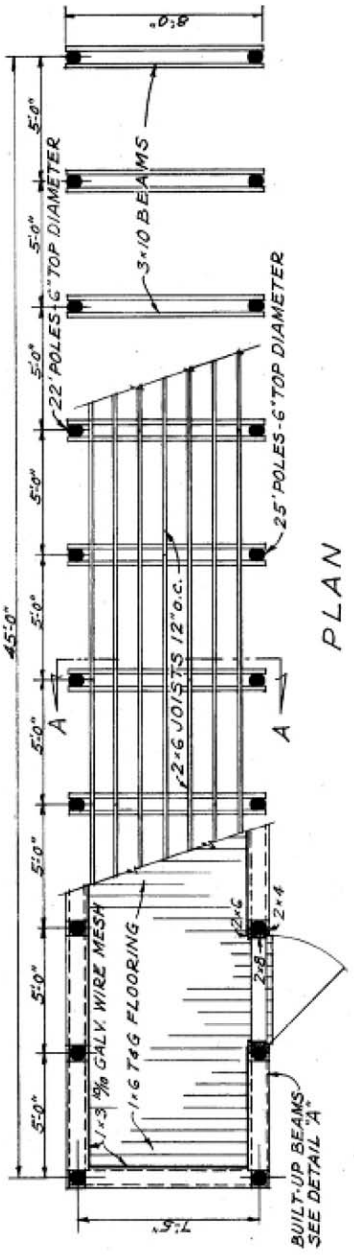
Chapter 4: Pole Corn Crib & Pole Building Parts

Plans Include:

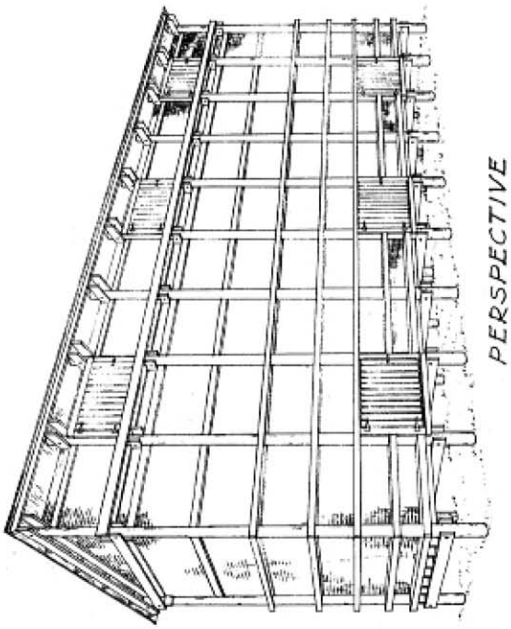
- Pole Corn Crib
- Pole Building Wall Construction
- Pole Building Framing for Sliding Door
- Pole Building Framing for Hinged Door
- Pole Building Roof Overhang at Endwall
- Pole Building Window Installation

Pole Corn Crib

• Plan • Perspective View



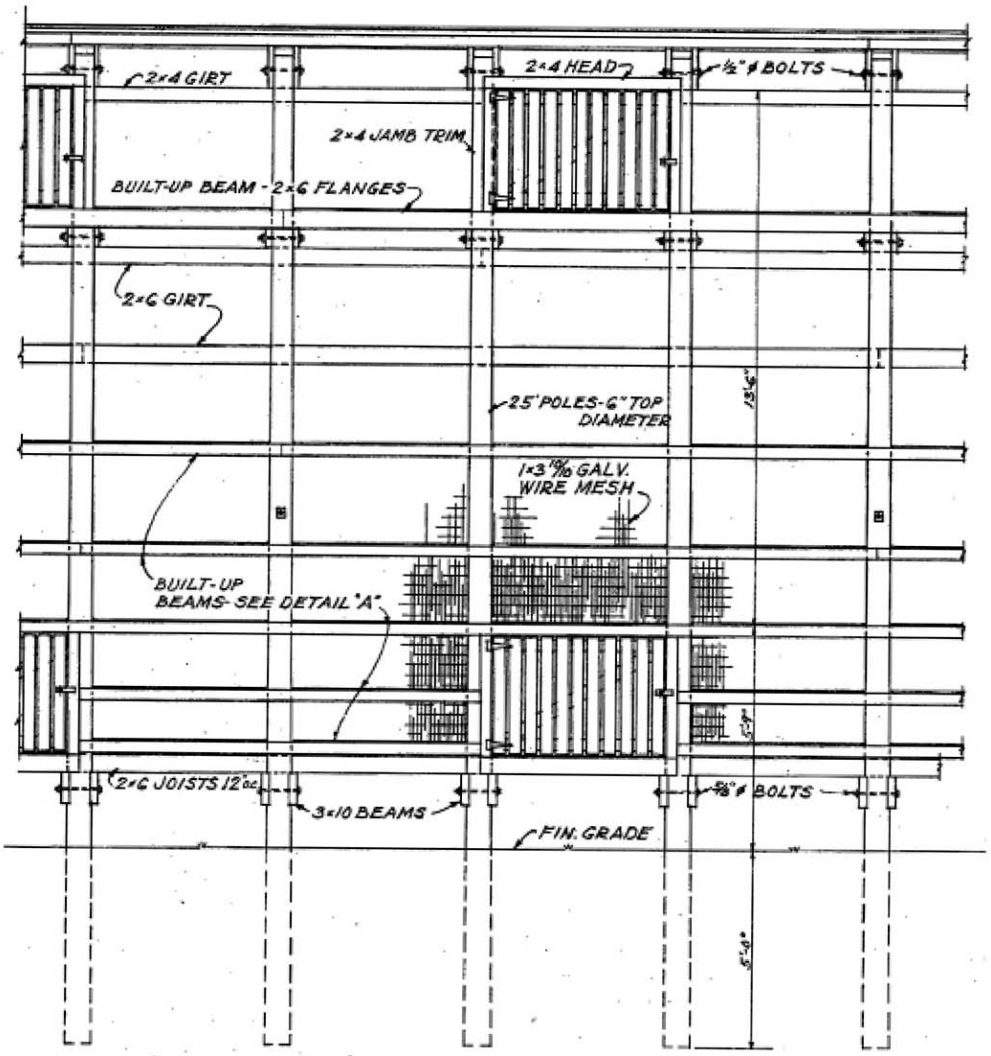
PLAN



PERSPECTIVE

Pole Corn Crib

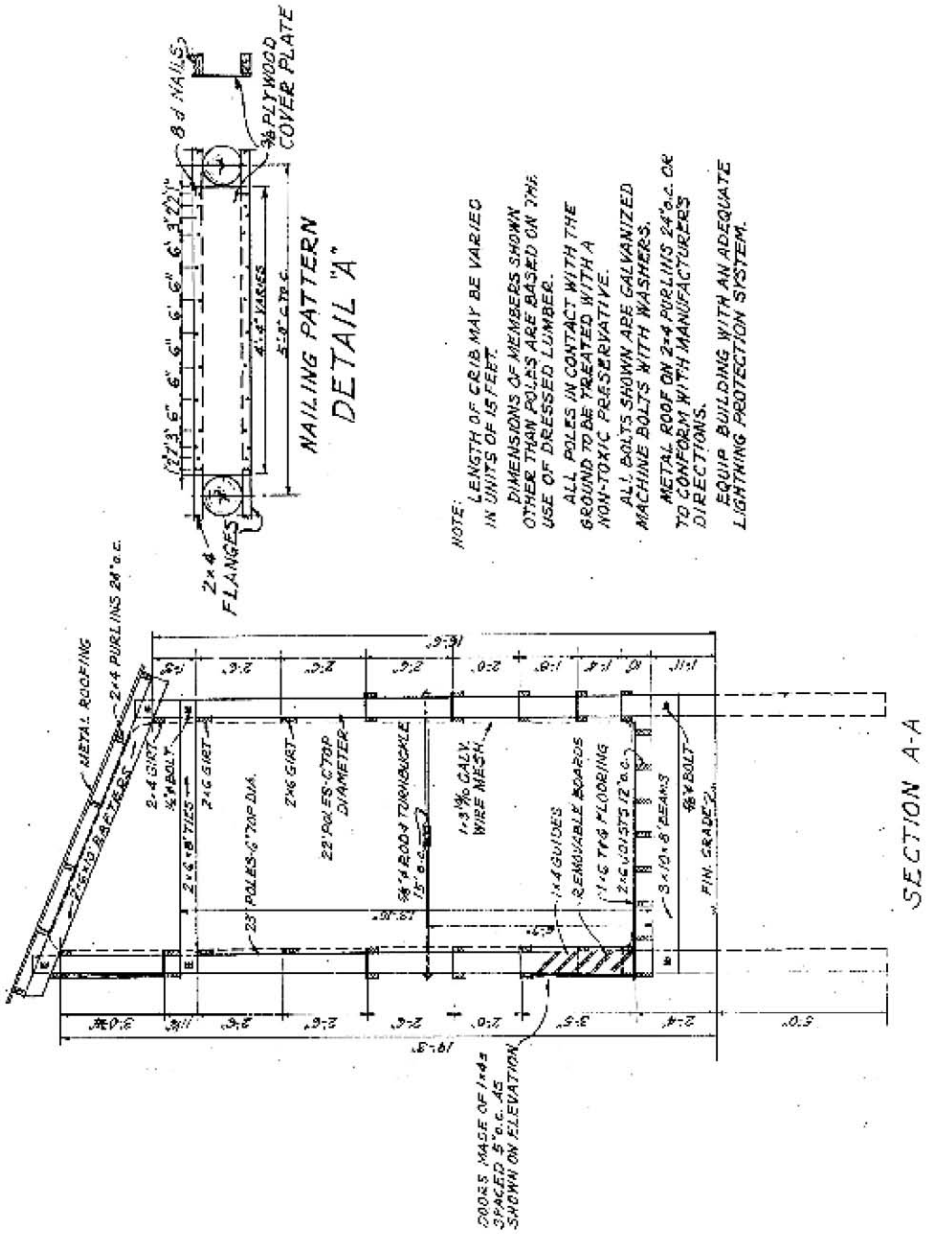
- Part Elevation



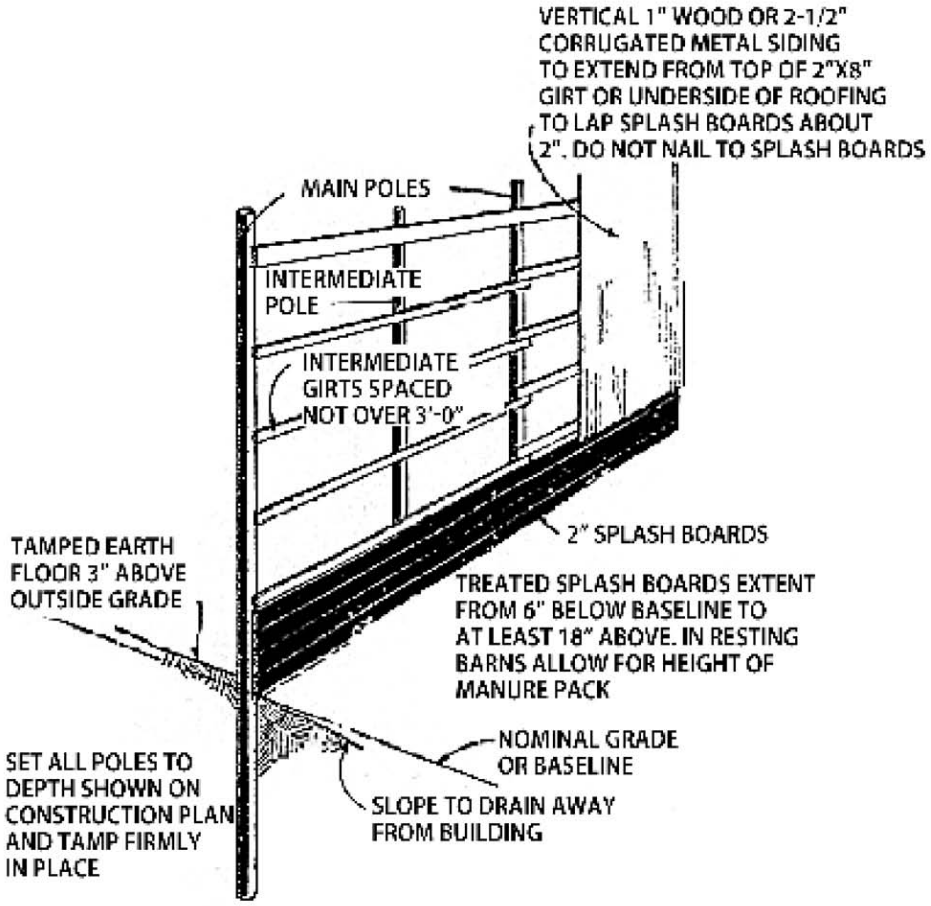
PART ELEVATION

POLE CORN CRIB

• Section A-A • Detail A • Notes


NAILING PATTERN
DETAIL "A"
8d NAILS
⅜ PLYWOOD COVER PLATE
2×4 FLANGES
NOTE:
LENGTH OF CRIB MAY BE VARIED IN UNITS OF 15 FEET.
DIMENSIONS OF MEMBERS SHOWN OTHER THAN POLES ARE BASED ON THE USE OF DRESSED LUMBER.
ALL POLES IN CONTACT WITH THE GROUND TO BE TREATED WITH A NON-TOXIC PRESERVATIVE.
ALL BOLTS SHOWN ARE GALVANIZED MACHINE BOLTS WITH WASHERS.
METAL ROOF ON 2×4 PURLINS 24"o.c. OR TO CONFORM WITH MANUFACTURER'S DIRECTIONS.
EQUIP BUILDING WITH AN ADEQUATE LIGHTNING PROTECTION SYSTEM.
METAL ROOFING
2×4 PURLINS 24"o.c.
2×4 GIRT
2×6 GIRT
23' POLES-6' TOP DIA.
23' POLES-6' TOP DIAMETER
⅝" ROD TURNBUCKLE
1-3½ GALV. WIRE MESH
1×4 GUIDES REMOVABLE BOARDS
1×6 T&G FLOORING
2×6 JOISTS 12"o.c.
3×10×8' BEAMS
⅝" BOLT
FIN. GRADE
DOORS MADE OF 1×4's SPACED 5"o.c. AS SHOWN ON ELEVATION
SECTION A-A

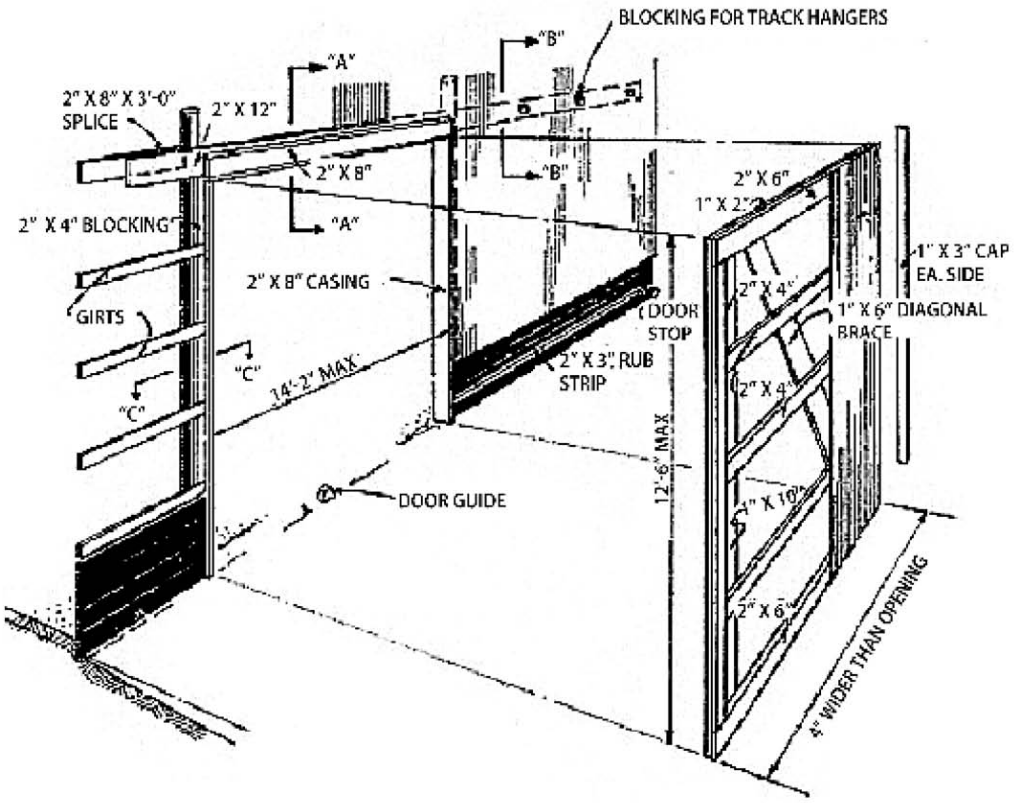
POLE BUILDING WALL CONSTRUCTION


VERTICAL 1" WOOD OR 2-1/2" CORRUGATED METAL SIDING TO EXTEND FROM TOP OF 2"X8" GIRT OR UNDERSIDE OF ROOFING TO LAP SPLASH BOARDS ABOUT 2". DO NOT NAIL TO SPLASH BOARDS
MAIN POLES
INTERMEDIATE POLE
INTERMEDIATE GIRTS SPACED NOT OVER 3'-0"
2" SPLASH BOARDS
TAMPED EARTH FLOOR 3" ABOVE OUTSIDE GRADE
TREATED SPLASH BOARDS EXTENT FROM 6" BELOW BASELINE TO AT LEAST 18" ABOVE. IN RESTING BARNS ALLOW FOR HEIGHT OF MANURE PACK
NOMINAL GRADE OR BASELINE
SET ALL POLES TO DEPTH SHOWN ON CONSTRUCTION PLAN AND TAMP FIRMLY IN PLACE
SLOPE TO DRAIN AWAY FROM BUILDING

TYPICAL WALL CONSTRUCTION
(ROOF FRAMING NOT SHOWN)

POLE BUILDING FRAMING FOR SLIDING DOOR

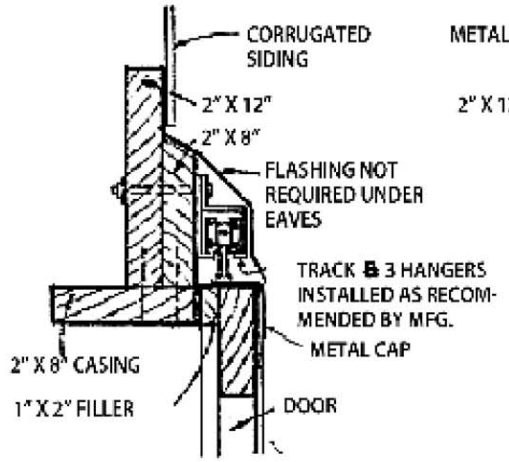
- Plan



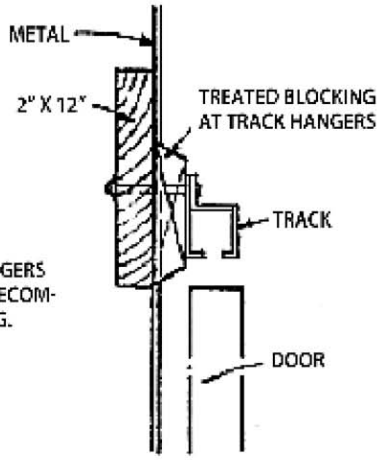
TYPICAL FRAMING FOR SLIDING DOOR

Pole Building Framing for Sliding Door

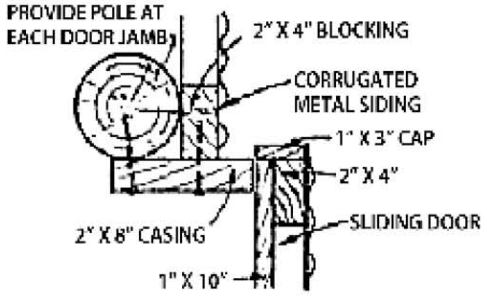
- Sections A-A, B-B, & C-C



SECTION A-A

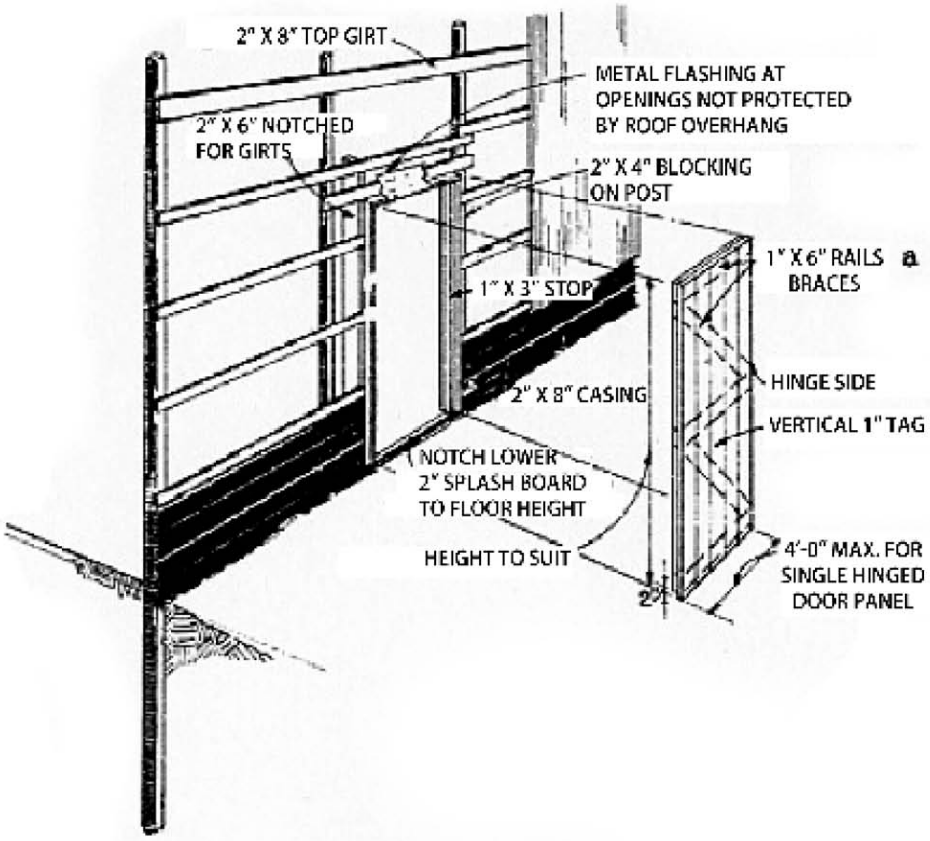


SECTION B-B



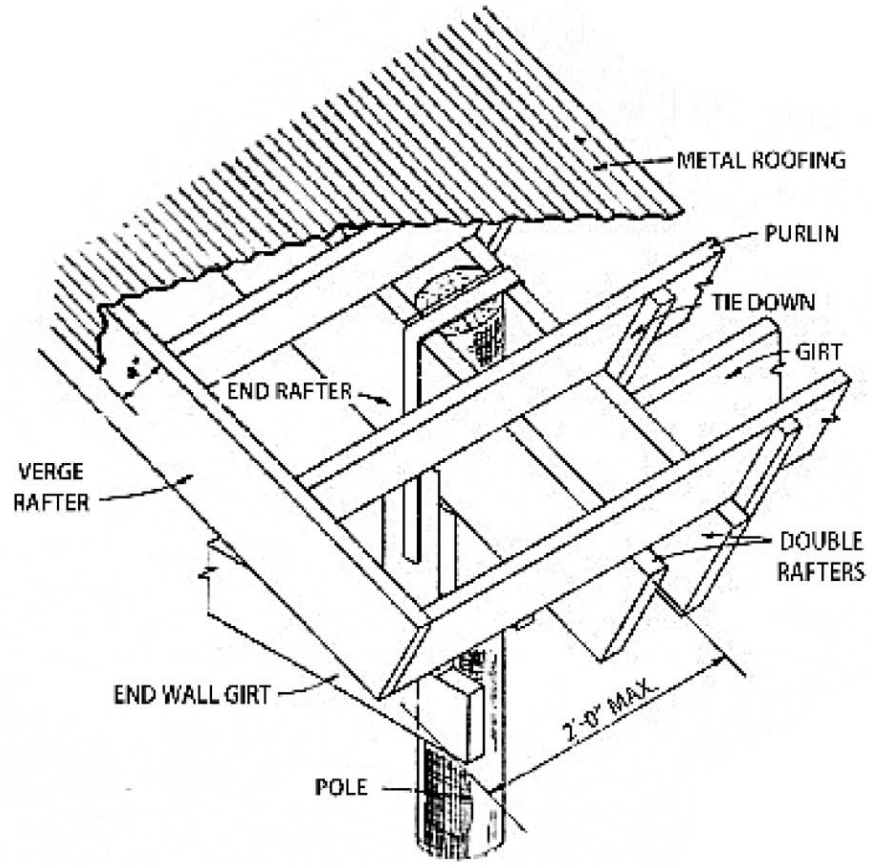
SECTION C-C

Pole Building Framing for Hinged Door


2" X 8" TOP GIRT
METAL FLASHING AT OPENINGS NOT PROTECTED BY ROOF OVERHANG
2" X 6" NOTCHED FOR GIRTS
2" X 4" BLOCKING ON POST
1" X 6" RAILS & BRACES
1" X 3" STOP
HINGE SIDE
2" X 8" CASING
VERTICAL 1" TAG
NOTCH LOWER 2" SPLASH BOARD TO FLOOR HEIGHT
HEIGHT TO SUIT
4'-0" MAX. FOR SINGLE HINGED DOOR PANEL

TYPICAL FRAMING FOR HINGED DOOR

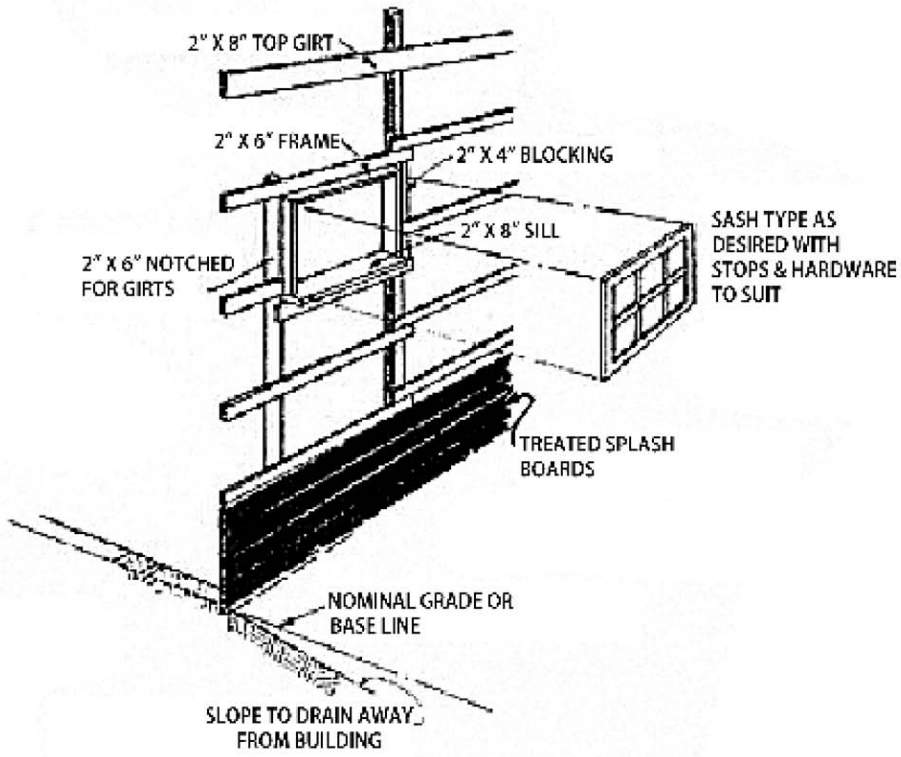
POLE BUILDING ROOF OVERHANG AT ENDWALL



ROOF OVERHANG AT ENDWALL

(DOUBLE RAFTERS & PURLIN CONSTRUCTION SHOWN)
WHEN SHEATHING IS USED INSTEAD OF PURLINS IT MAY BE EXTENDED IN SIMILIAR MANNER, PROVIDE BLOCKING BETWEEN END & VERGE RAFTERS IF OVERHANG EXCEEDS 12".

Pole Building Window Installation


2" X 8" TOP GIRT
2" X 6" FRAME
2" X 4" BLOCKING
2" X 8" SILL
SASH TYPE AS DESIRED WITH STOPS & HARDWARE TO SUIT
2" X 6" NOTCHED FOR GIRTS
TREATED SPLASH BOARDS
NOMINAL GRADE OR BASE LINE
SLOPE TO DRAIN AWAY FROM BUILDING

TYPICAL WINDOW INSTALLATION

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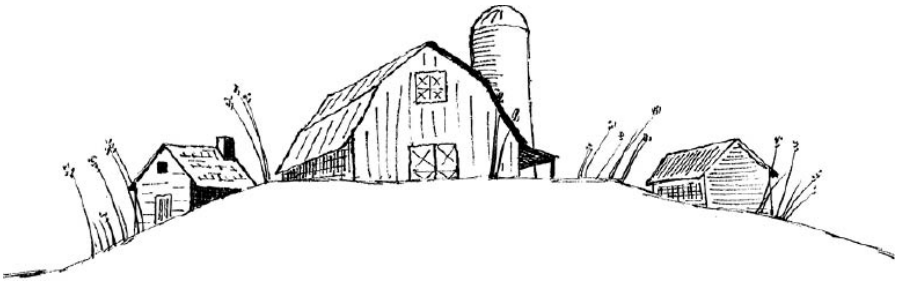


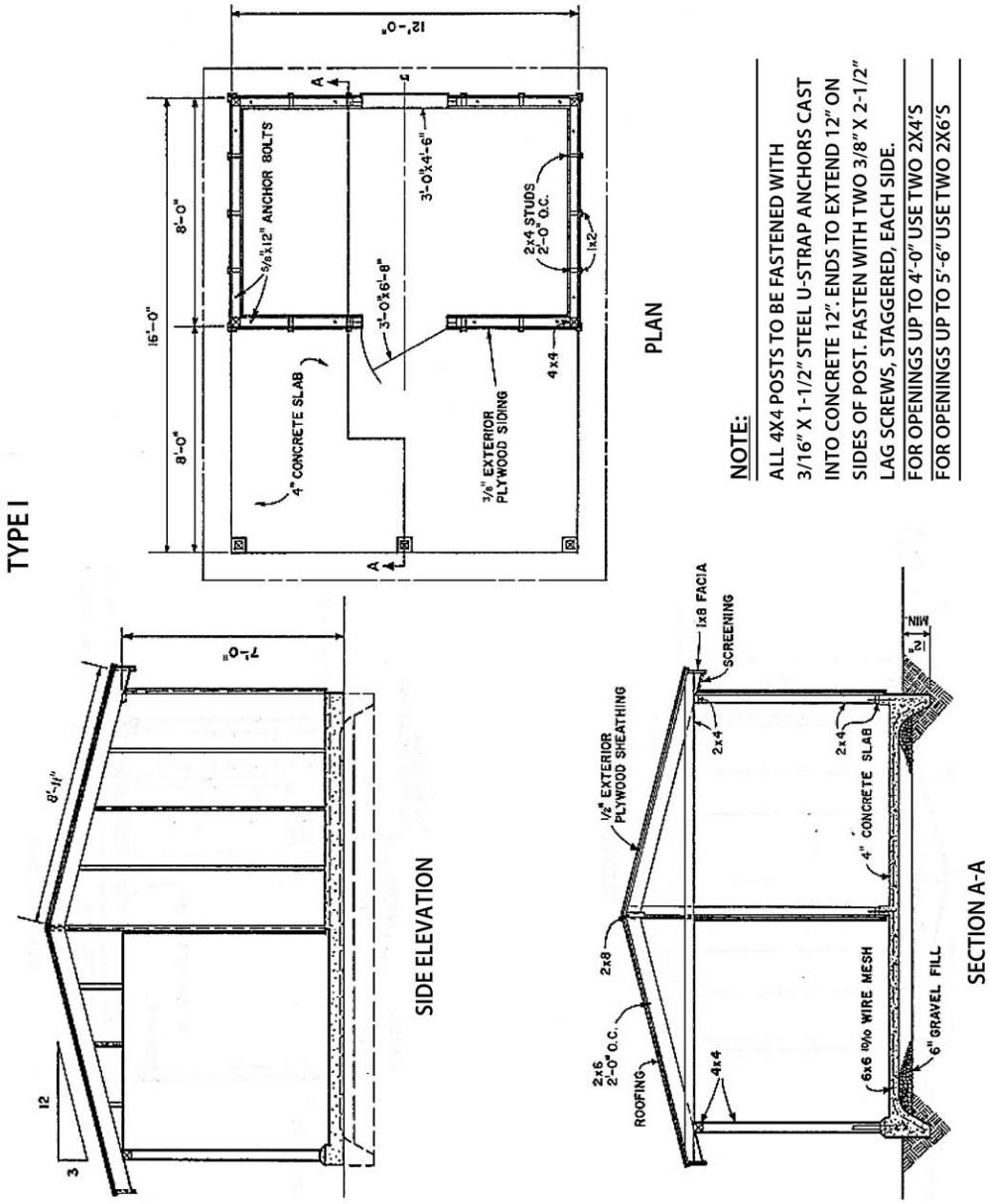
Chapter 5: Storage Sheds

Plans Include:

- Storage Shed I
- Storage Shed II
- Storage Shed III
- Case Study: Storage Sheds I
- Case Study: Storage Sheds II

STORAGE SHED I

• Plan • Side Elevation • Section A-A



NOTE:

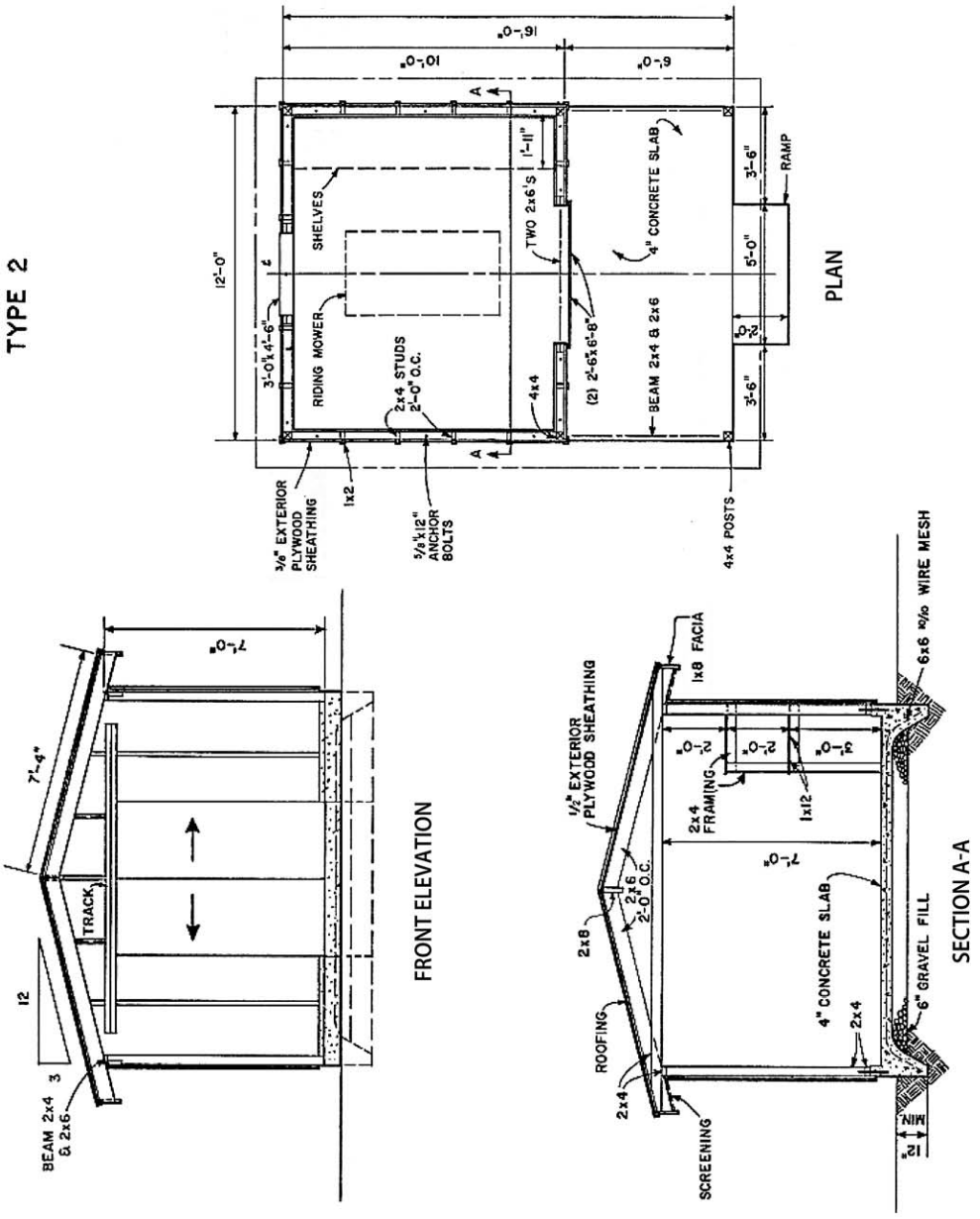
ALL 4X4 POSTS TO BE FASTENED WITH 3/16" X 1-1/2" STEEL U-STRAP ANCHORS CAST INTO CONCRETE 12". ENDS TO EXTEND 12" ON SIDES OF POST. FASTEN WITH TWO 3/8" X 2-1/2" LAG SCREWS, STAGGERED, EACH SIDE.

FOR OPENINGS UP TO 4'-0" USE TWO 2X4'S

FOR OPENINGS UP TO 5'-6" USE TWO 2X6'S

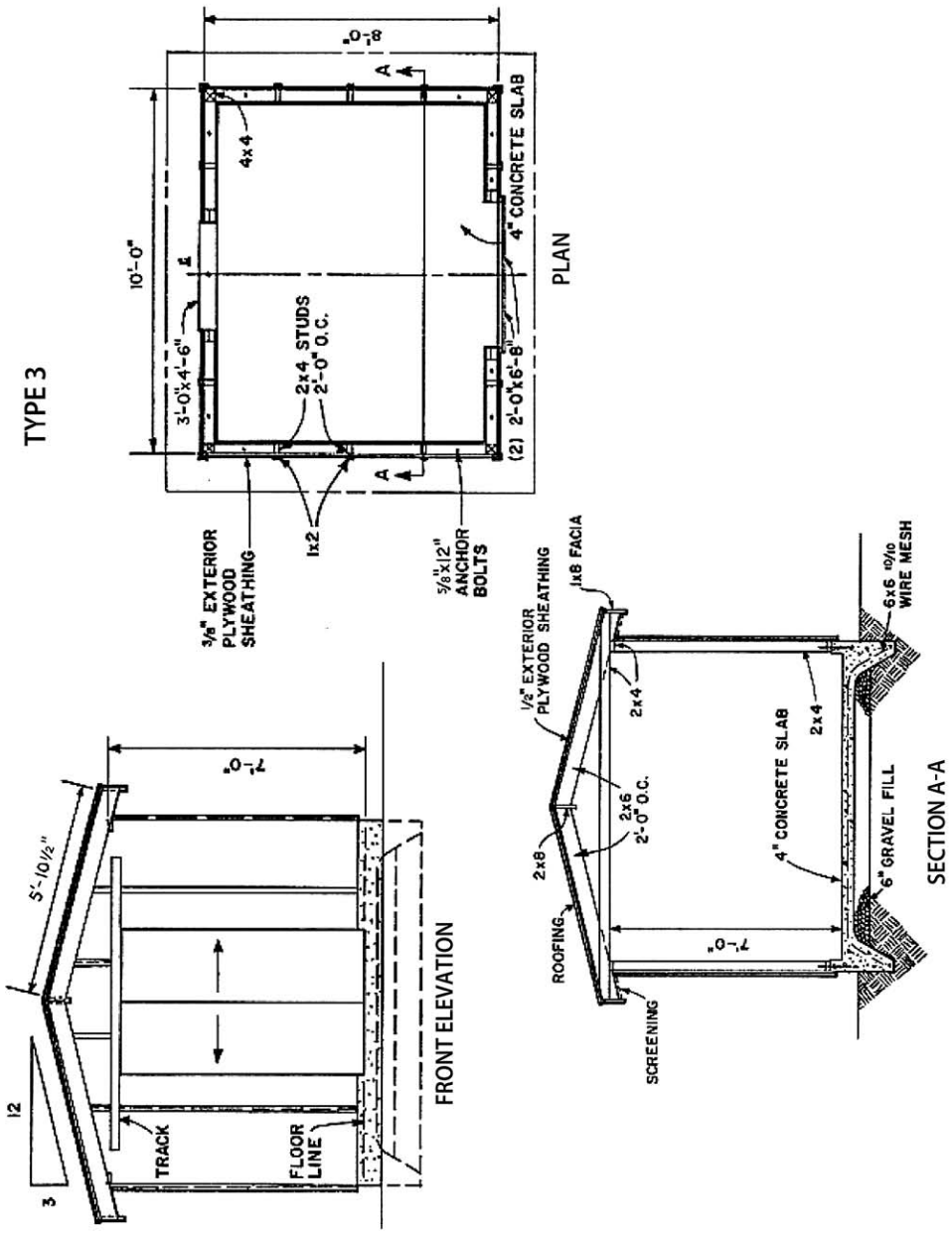
STORAGE SHED II

• Plan • Front Elevation • Section A-A



STORAGE SHED III

• Plan • Front Elevation • Section A-A



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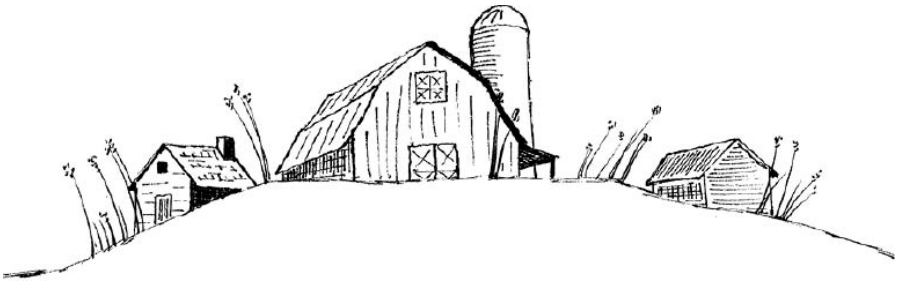


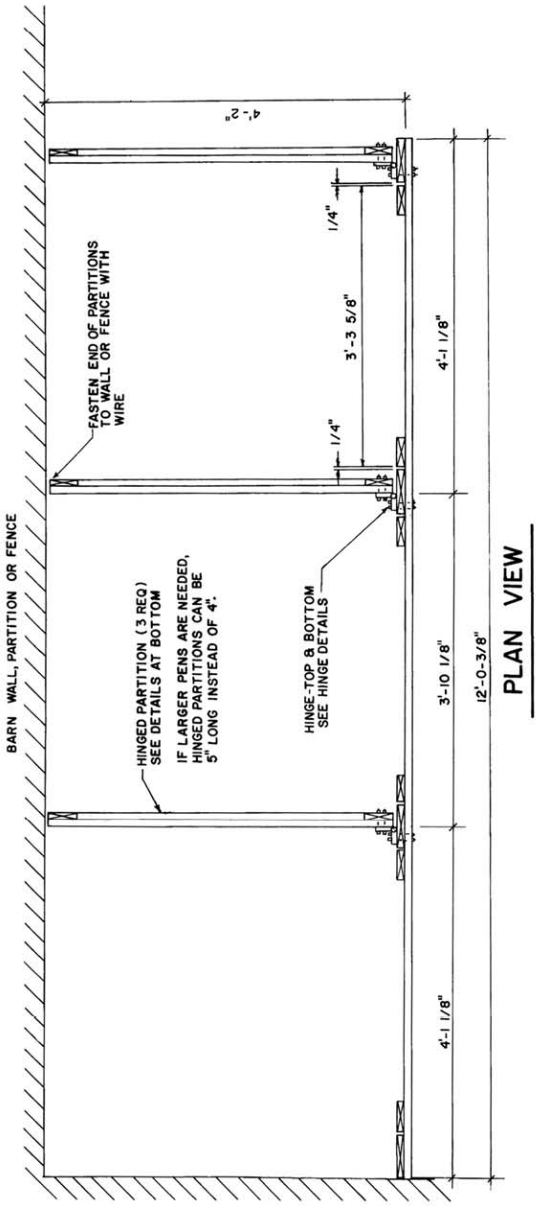
Chapter 6: Small Farm Animal Buildings

Plans Include:

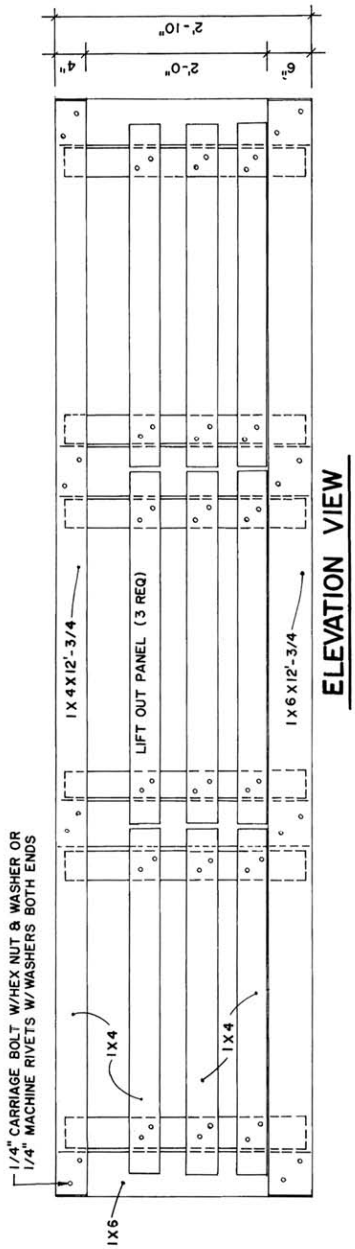
- Portable Lambing Unit
- 10x12 Poultry House
- Poultry House II
- Rabbit Hutch
- Dog House I
- Dog House II
- Dog House III

PORTABLE LAMBING UNIT

- Plan View • Elevation View


BARN WALL, PARTITION OR FENCE
FASTEN END OF PARTITIONS TO WALL OR FENCE WITH WIRE
HINGED PARTITION (3 REQ) SEE DETAILS AT BOTTOM
IF LARGER PENS ARE NEEDED, HINGED PARTITIONS CAN BE 5" LONG INSTEAD OF 4".
HINGE-TOP & BOTTOM SEE HINGE DETAILS
4'-2"
1/4"
3'-3 5/8"
1/4"
4'-1 1/8"
3'-10 1/8"
4'-1 1/8"
12'-0-3/8"

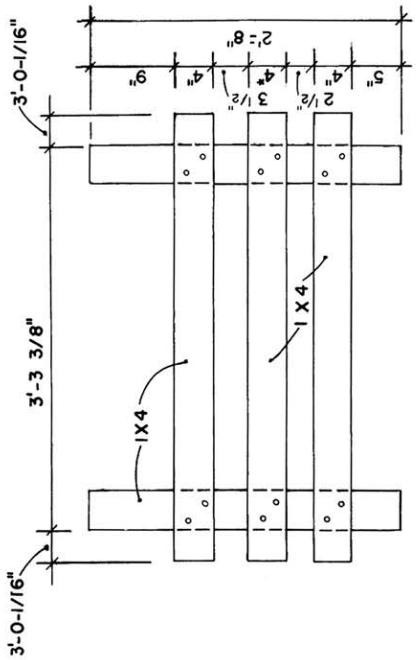
PLAN VIEW



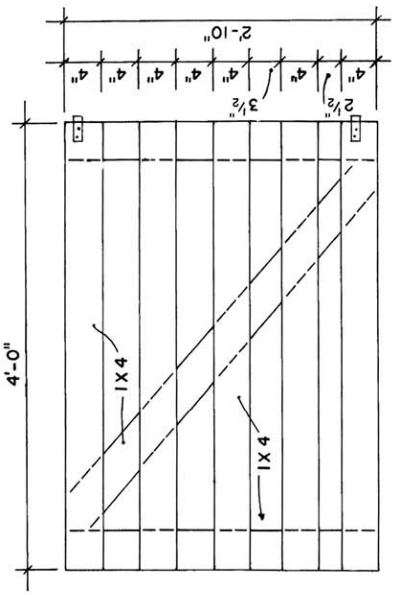
ELEVATION VIEW

PORTABLE LAMBING UNIT

• Lift Out Panel Details • Partition Details



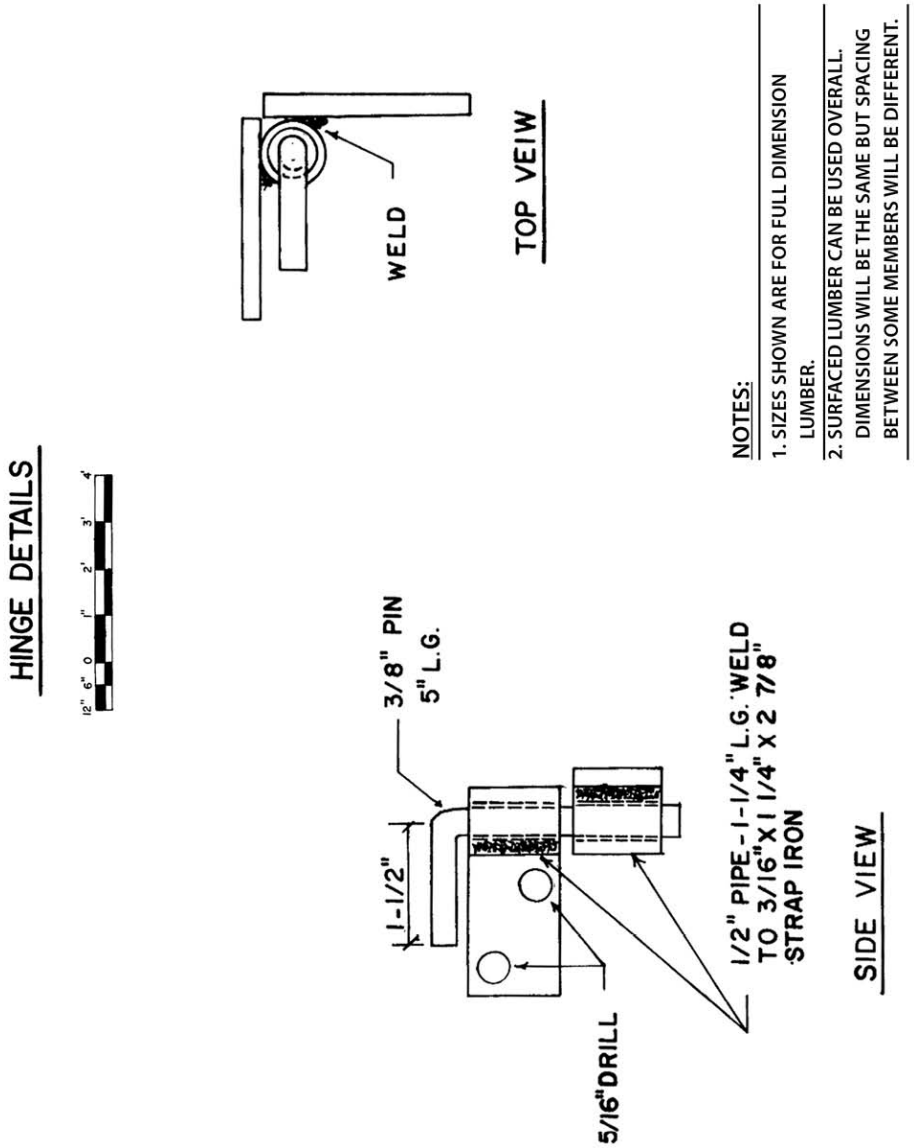
LIFT OUT PANEL DETAILS



PARTITION DETAILS

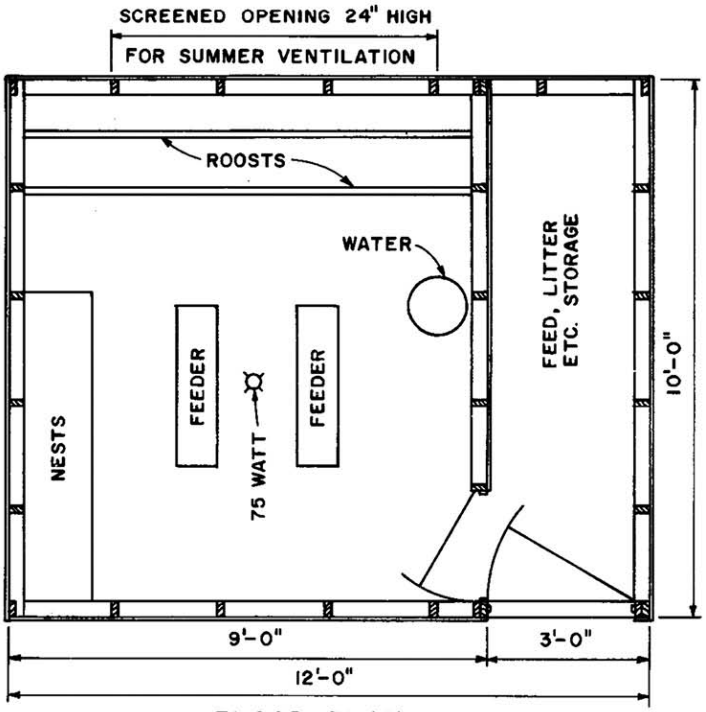
Portable Lambing Unit

• Hinge Details • Top View • Side View

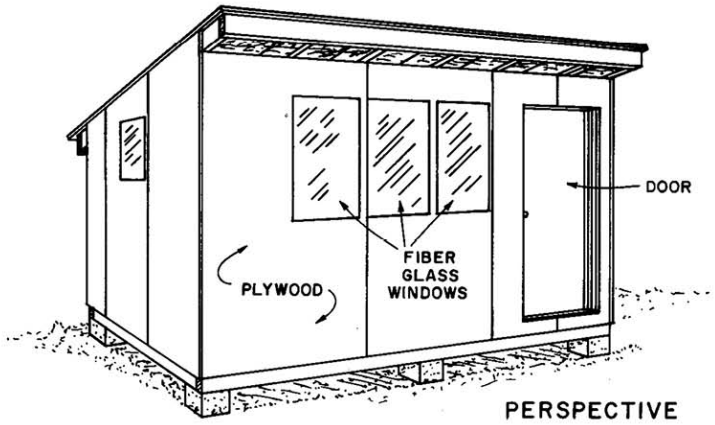

HINGE DETAILS
12" 6" 0 1' 2' 3' 4'
WELD
TOP VEIW
3/8" PIN
5" L.G.
1-1/2"
1/2" PIPE-1-1/4" L.G. WELD
TO 3/16"X1 1/4" X 2 7/8"
STRAP IRON
5/16" DRILL
SIDE VIEW
NOTES:
1. SIZES SHOWN ARE FOR FULL DIMENSION LUMBER.
2. SURFACED LUMBER CAN BE USED OVERALL. DIMENSIONS WILL BE THE SAME BUT SPACING BETWEEN SOME MEMBERS WILL BE DIFFERENT.

10x12 Poultry House

• Plan • Perspective View



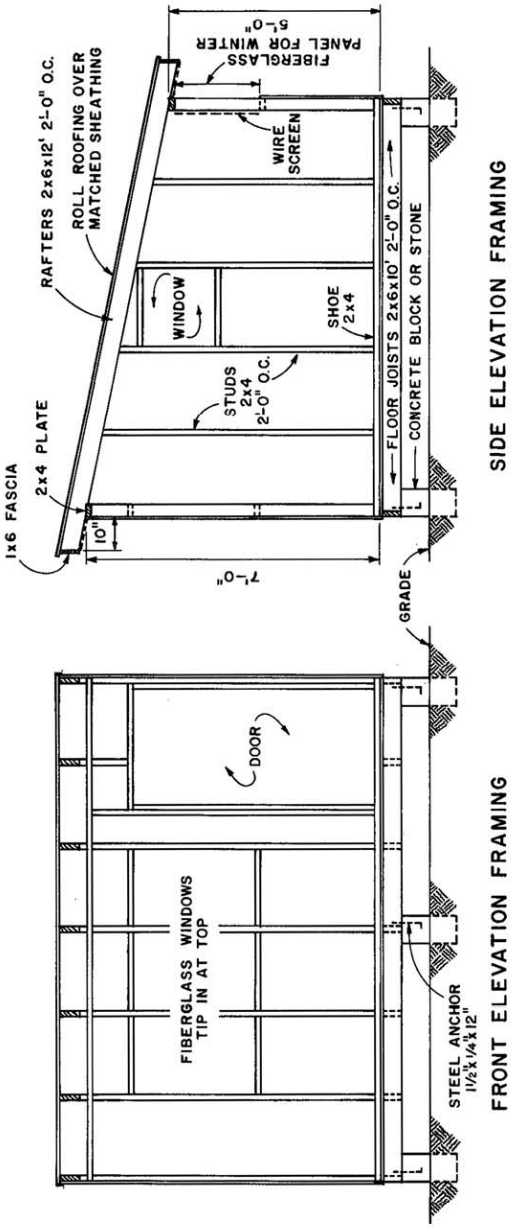
FLOOR PLAN



PERSPECTIVE

10X12 POULTRY HOUSE

• Front & Side Elevation Framing • Bill of Materials



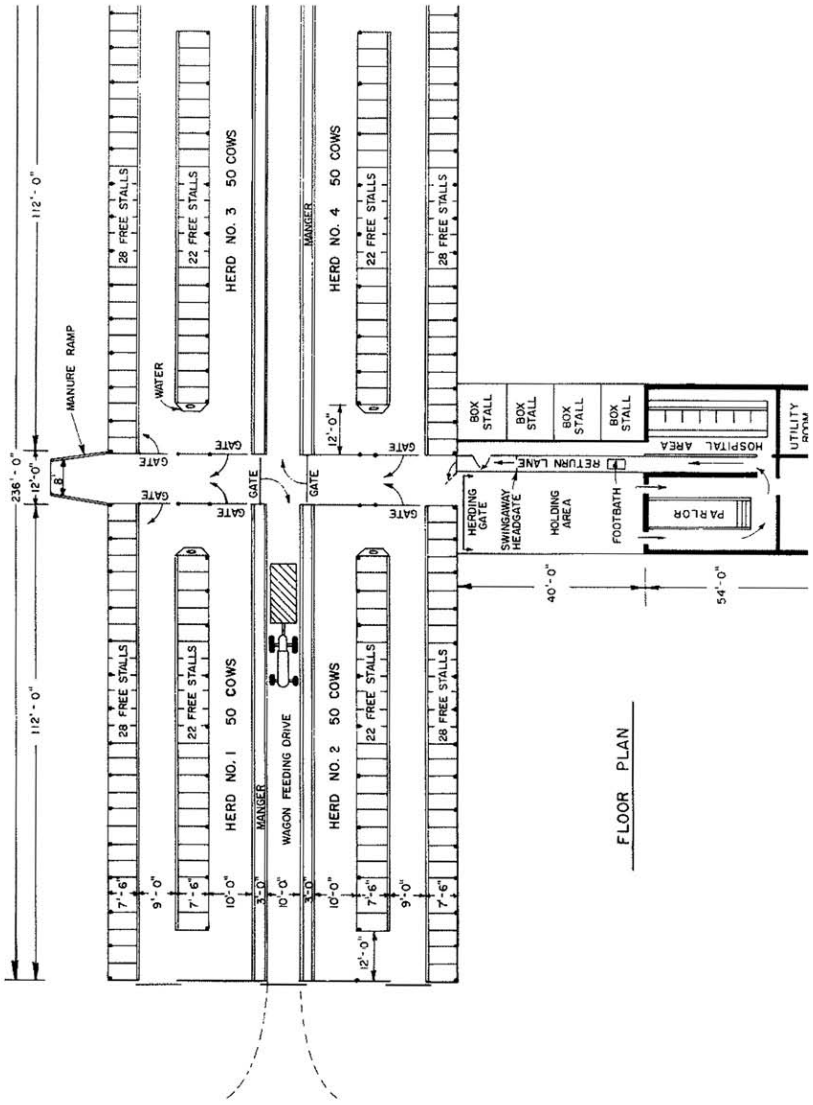
BILL OF MATERIALS

FOUNDATION	12 CONC. BLOCKS 8"x8"x16"
FLOOR JOISTS	7-PC. 2x6x10'
FR. & REAR SILLS	2-PC. 2x6x12'
FLOOR	150 BD. FT. T. & G. SHEATHING
SHOE	54 LIN. FT. 2x4
STUDS: REAR	9-PC. 2x4x5'
FRONT	9-PC. 2x4x7'
ENDS	8-PC. 2x4x12'
PARTITIONS	2-PC. 2x4x12'
PLATES	2-PC. 2x4x12'
ROOF	175 BD. FT. T. & G. SHEATHING 1½ SQS. ROLL ROOFING
SIDING & DOORS	11 SHEETS 4'x8'x½" EXT. PLYWOOD
WINDOWS	2-PC. 2'x10' FIBERGLASS (FLAT)
MISCL. FRAMING	4-PC. 2x4x12'
NAILS & HARDWARE	
RAFTERS	7-PC. 2x6x12'
ANCHORS-STEEL	6-PC. 1½"x¼"x12"
FASCIA	2-PC. 1x6x12'
DOOR STOPS	2-PC. 1x2x12' 1-PC. 1x2x6'

NOTE:
CONSULT LOCAL HEALTH AND BUILDING CODE AUTHORITIES BEFORE STARTING CONSTRUCTION

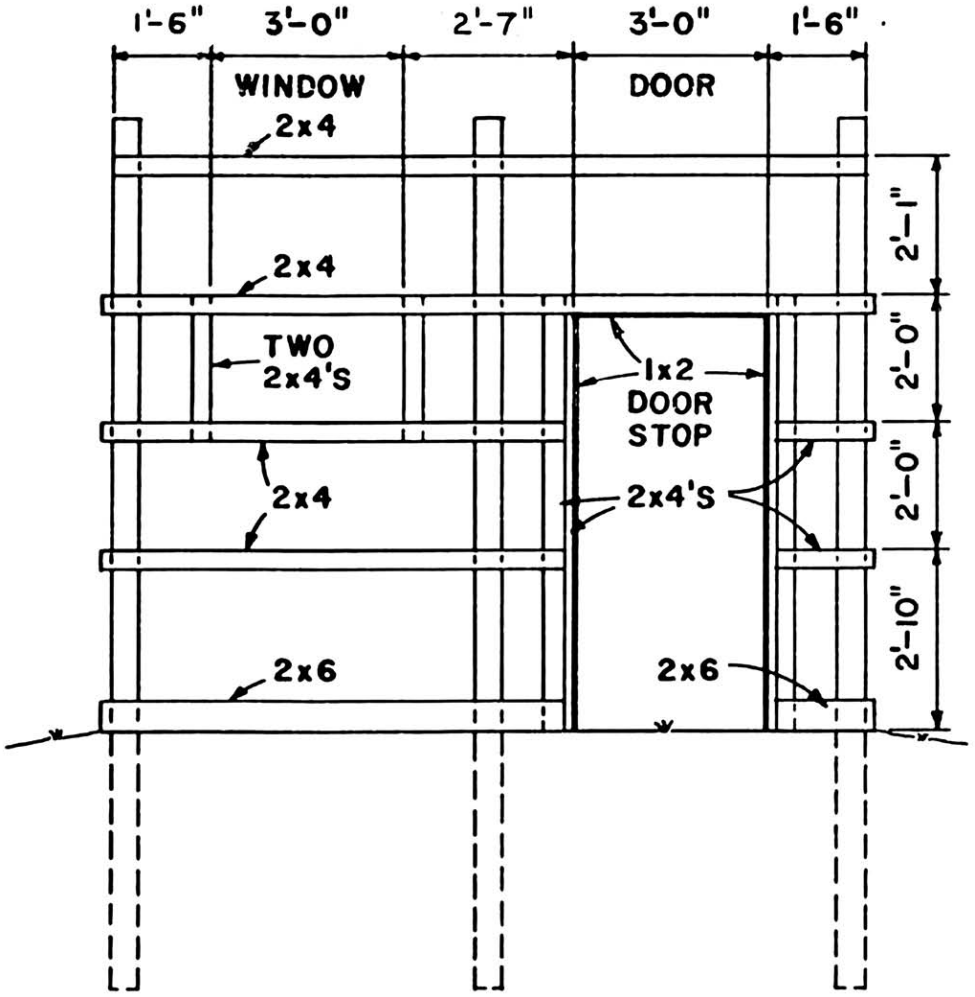
POULTRY HOUSE II

- Floor Plan



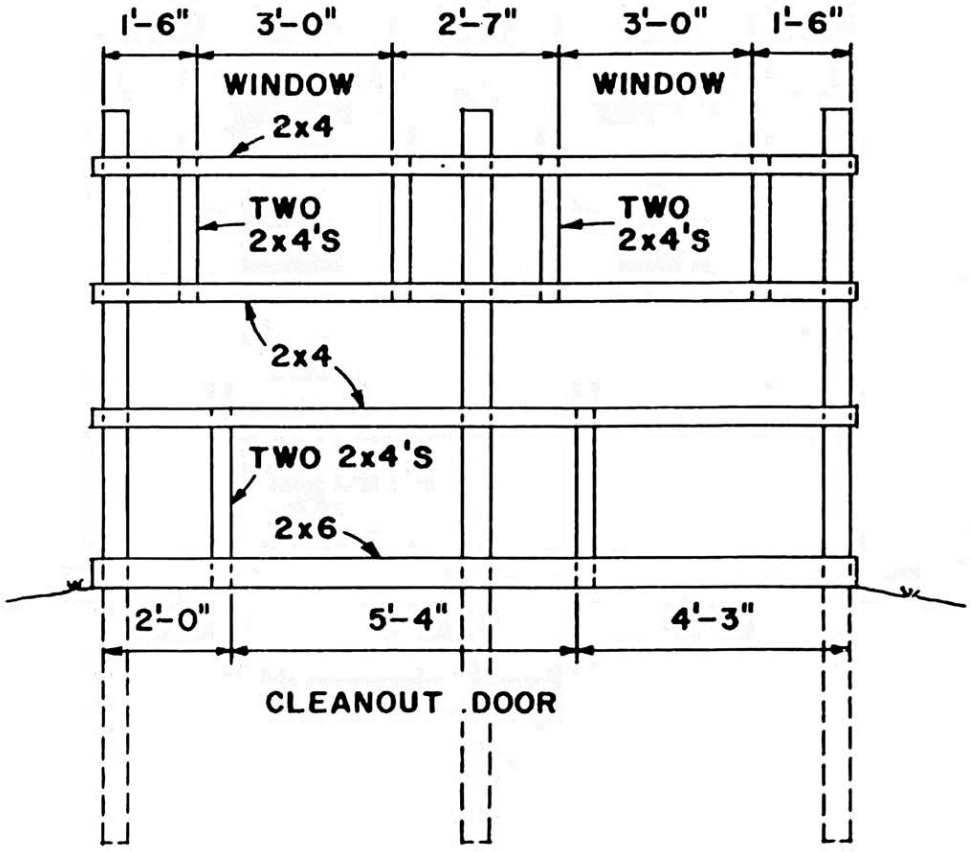
POULTRY HOUSE II

- Front Framing



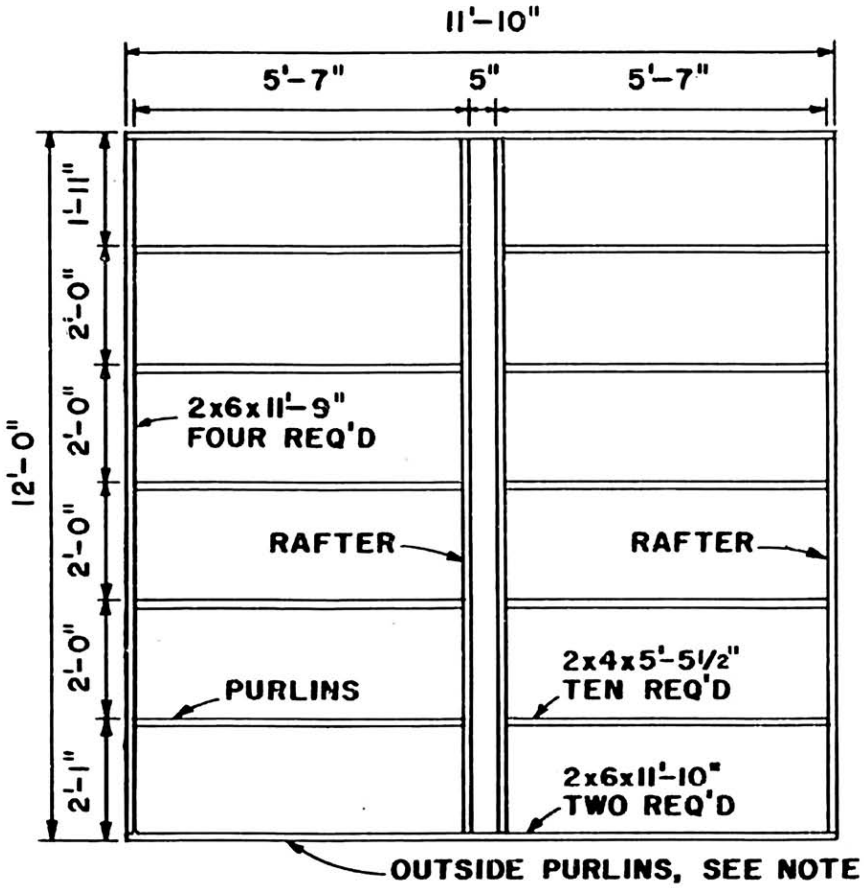
FRONT FRAMING

- Rear Framing



REAR FRAMING

- Roof Framing

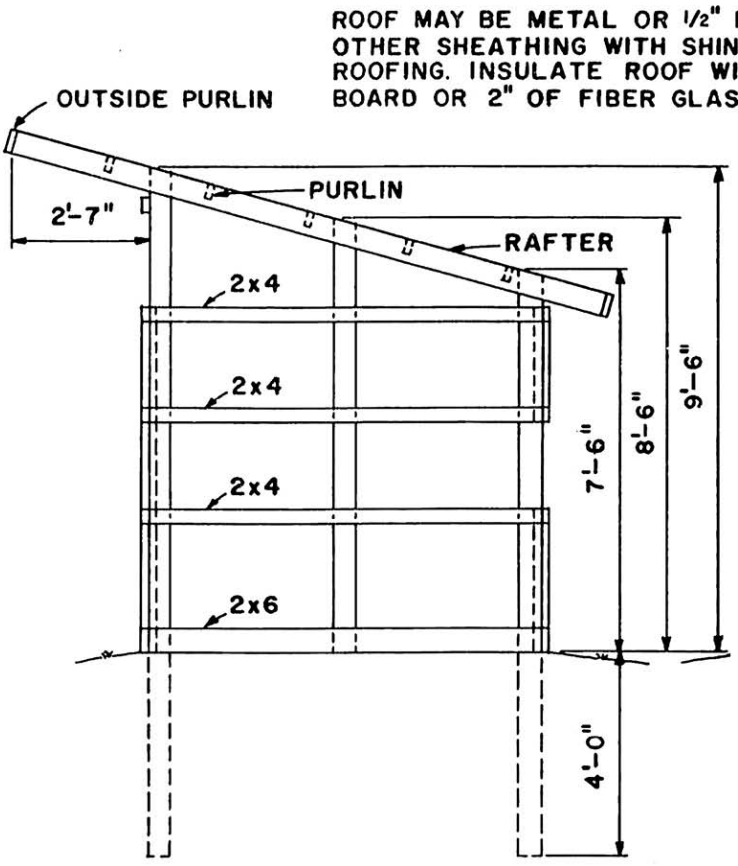


ROOF FRAMING

NOTE:
BUILD ROOF FRAME IN TWO PANELS. NAIL EACH PANEL TO P.T. POSTS, THEN ATTACH THE TWO OUTSIDE PURLINS.

POULTRY HOUSE II

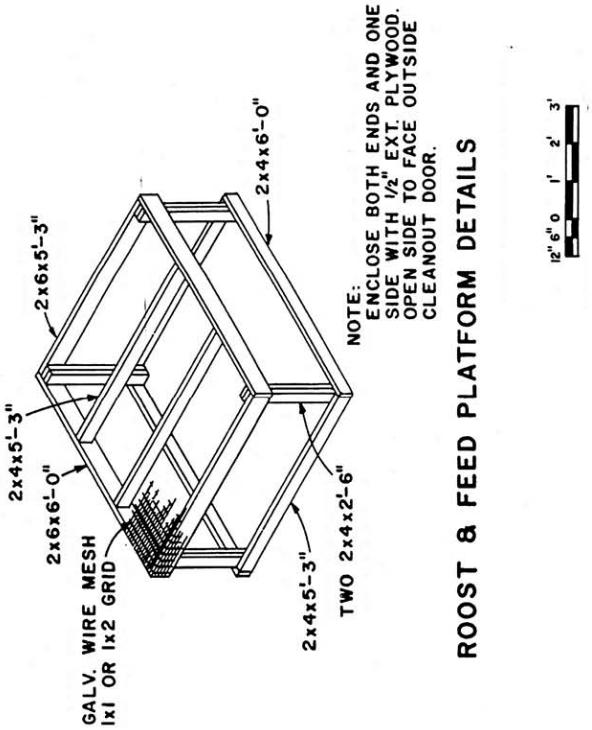
- Side Framing



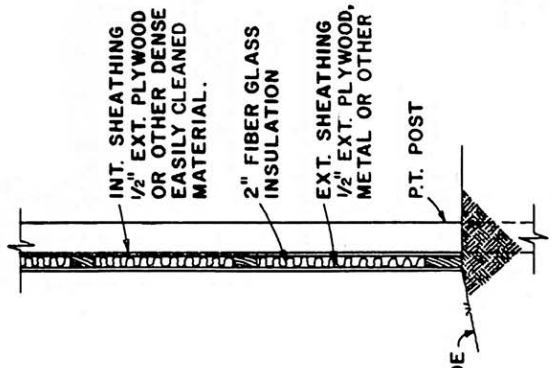
SIDE FRAMING

POULTRY HOUSE II

• Typical Wall Section • Roost & Feed Platform Details



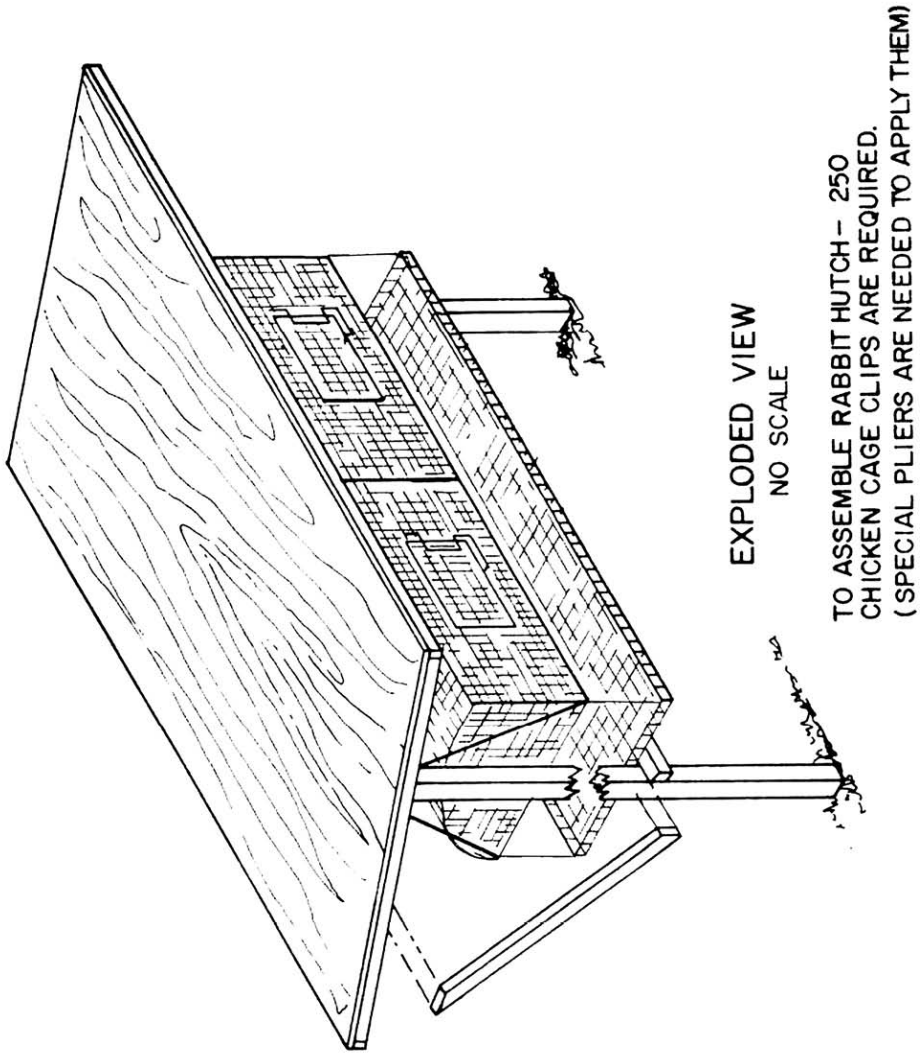
ROOST & FEED PLATFORM DETAILS



TYPICAL WALL SECTION

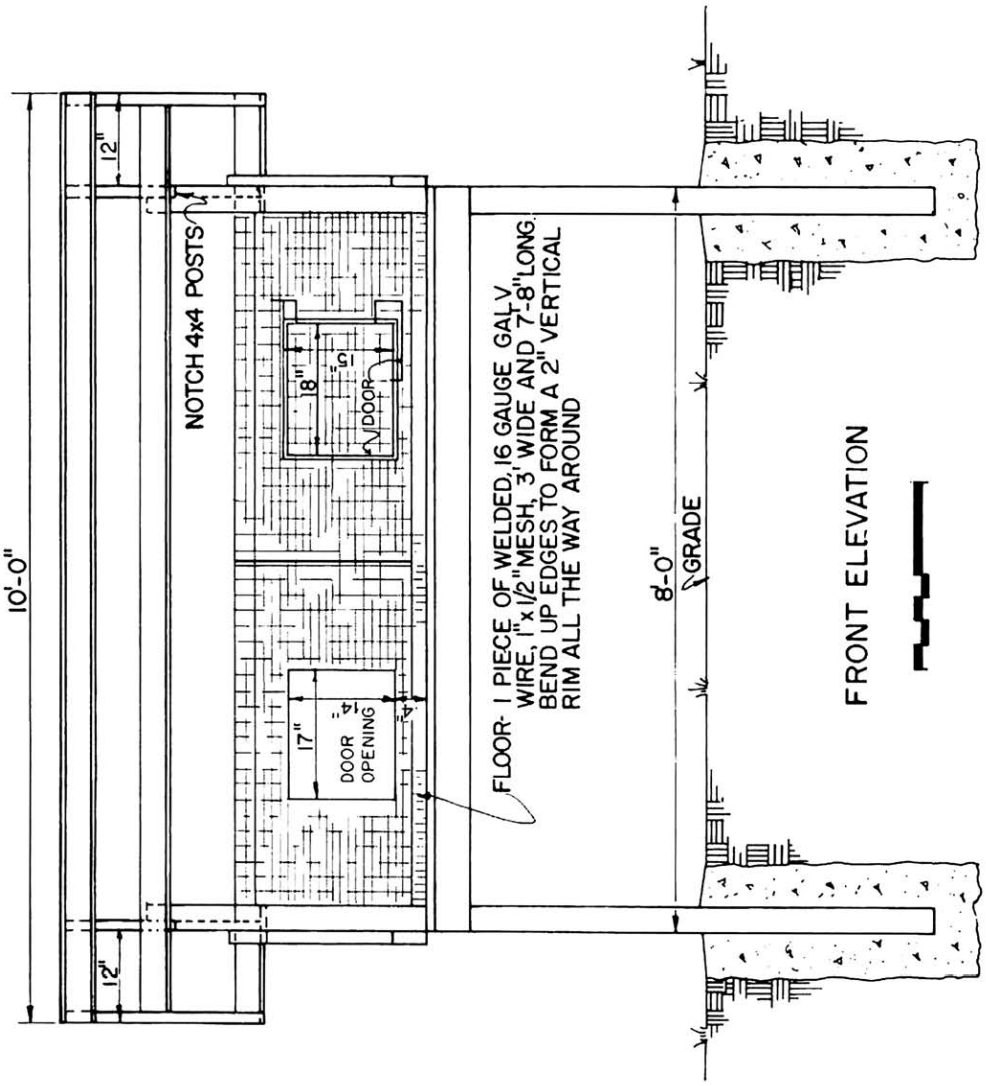
RABBIT HUTCH

- Exploded View


EXPLODED VIEW
NO SCALE
TO ASSEMBLE RABBIT HUTCH – 250
CHICKEN CAGE CLIPS ARE REQUIRED.
(SPECIAL PLIERS ARE NEEDED TO APPLY THEM)

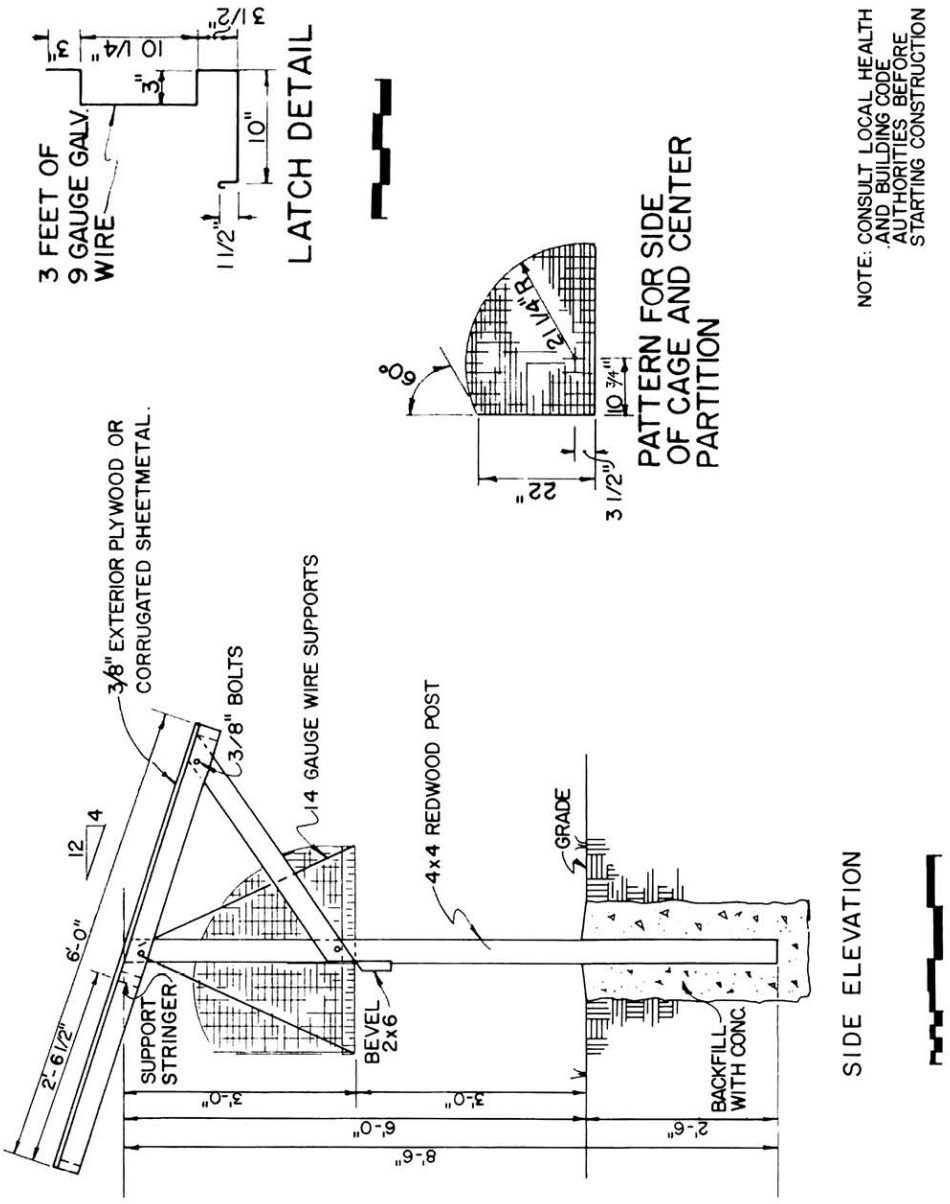
RABBIT HUTCH

- Front Elevation



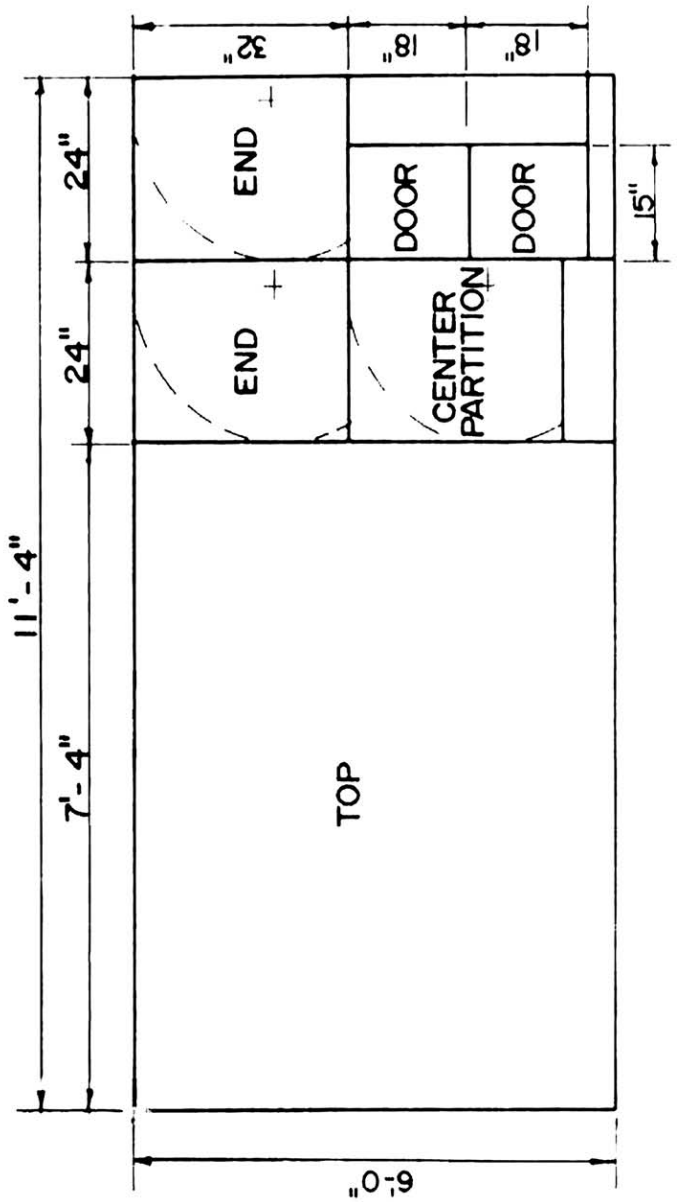
RABBIT HUTCH

- Side Elevation • Latch Detail • Pattern for Side of Cage and Center Partition


3 FEET OF 9 GAUGE GALV. WIRE
LATCH DETAIL
PATTERN FOR SIDE OF CAGE AND CENTER PARTITION
NOTE: CONSULT LOCAL HEALTH AND BUILDING CODE AUTHORITIES BEFORE STARTING CONSTRUCTION
3/8" EXTERIOR PLYWOOD OR CORRUGATED SHEETMETAL.
3/8" BOLTS
14 GAUGE WIRE SUPPORTS
4x4 REDWOOD POST
GRADE
SUPPORT STRINGER
BEVEL 2x6
BACKFILL WITH CONC.
SIDE ELEVATION

RABBIT HUTCH

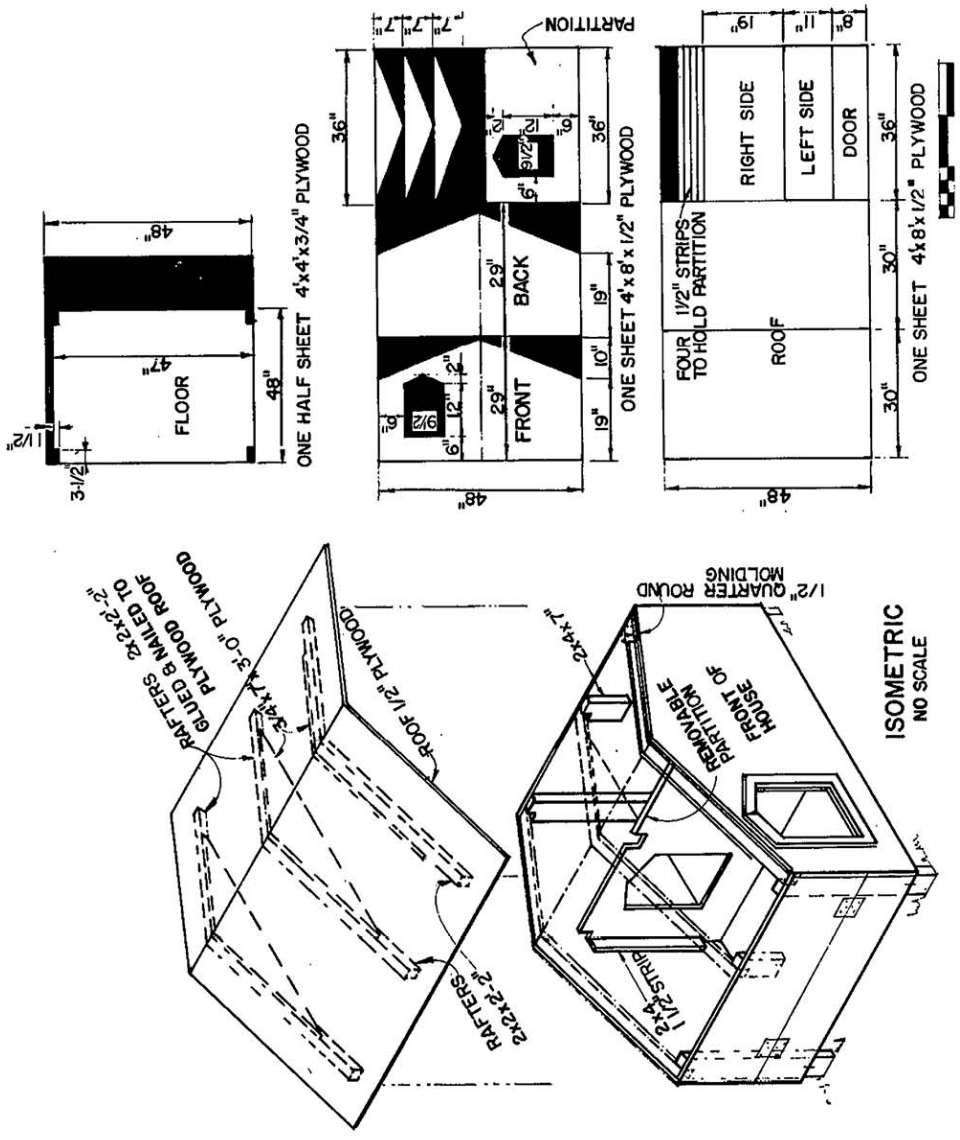
- Wire Mesh Cutting Diagram



WIRE MESH CUTTING DIAGRAM
1-PIECE OF WELDED, 14 GAUGE GALVANIZED WIRE, 1" x 2" MESH, 6' WIDE AND 11'-4" LONG.

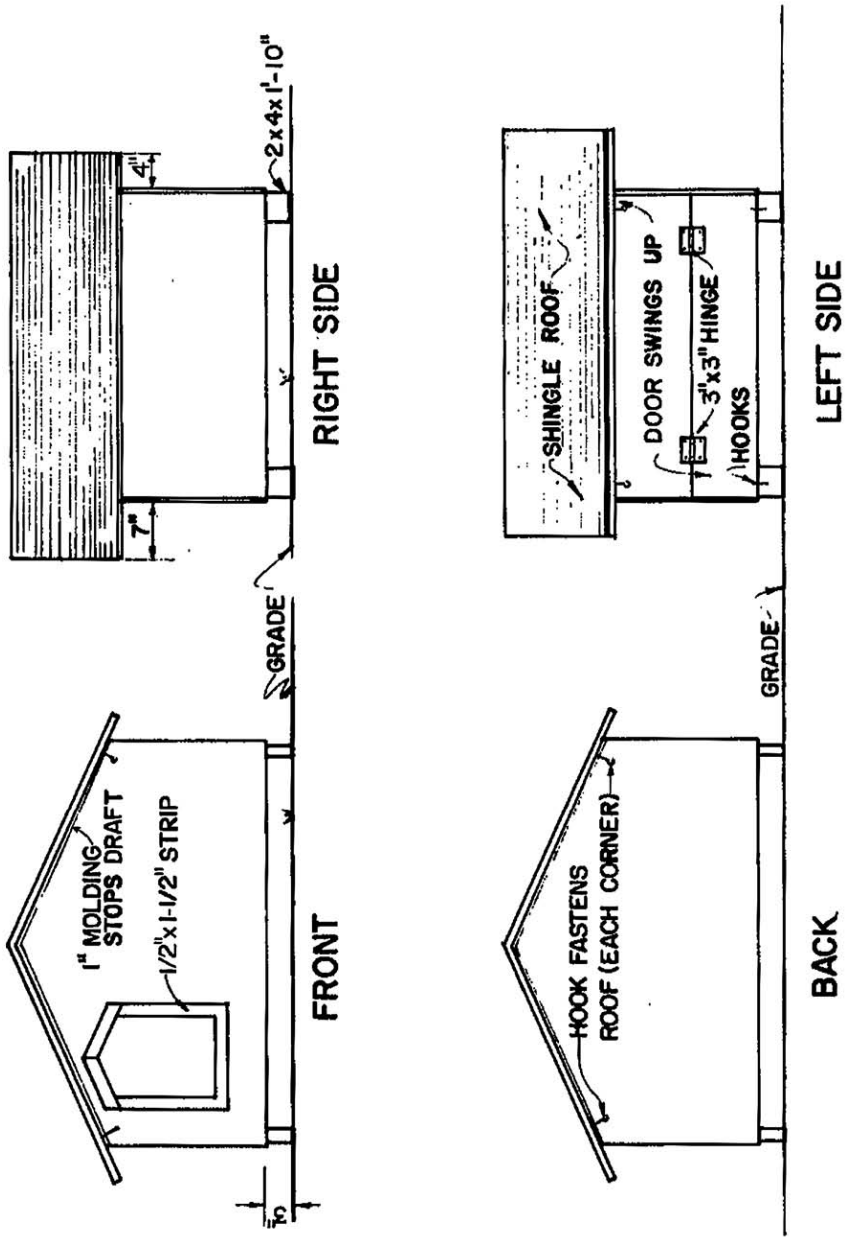
Dog House I

• Isometric View • Plywood Cutouts



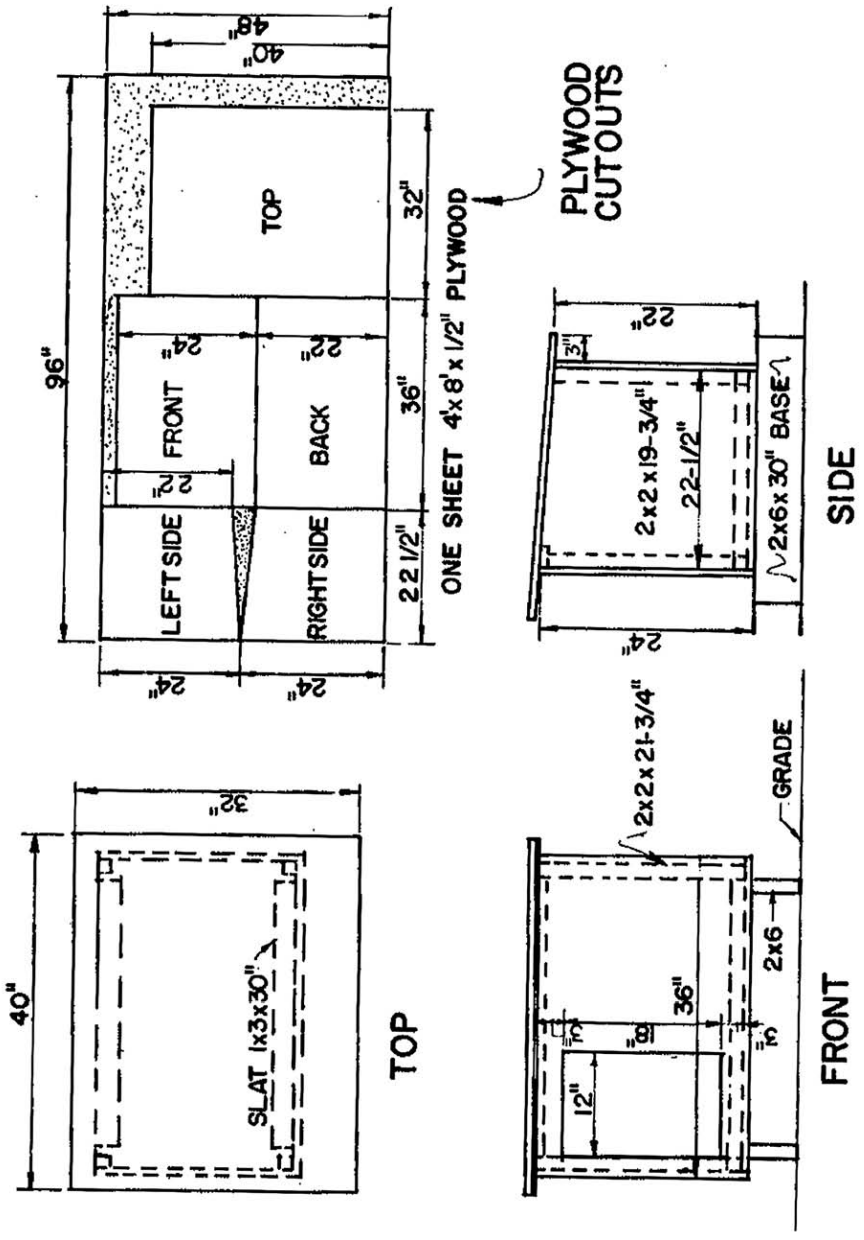
Dog House I

- Top, Front, Left, & Right Views



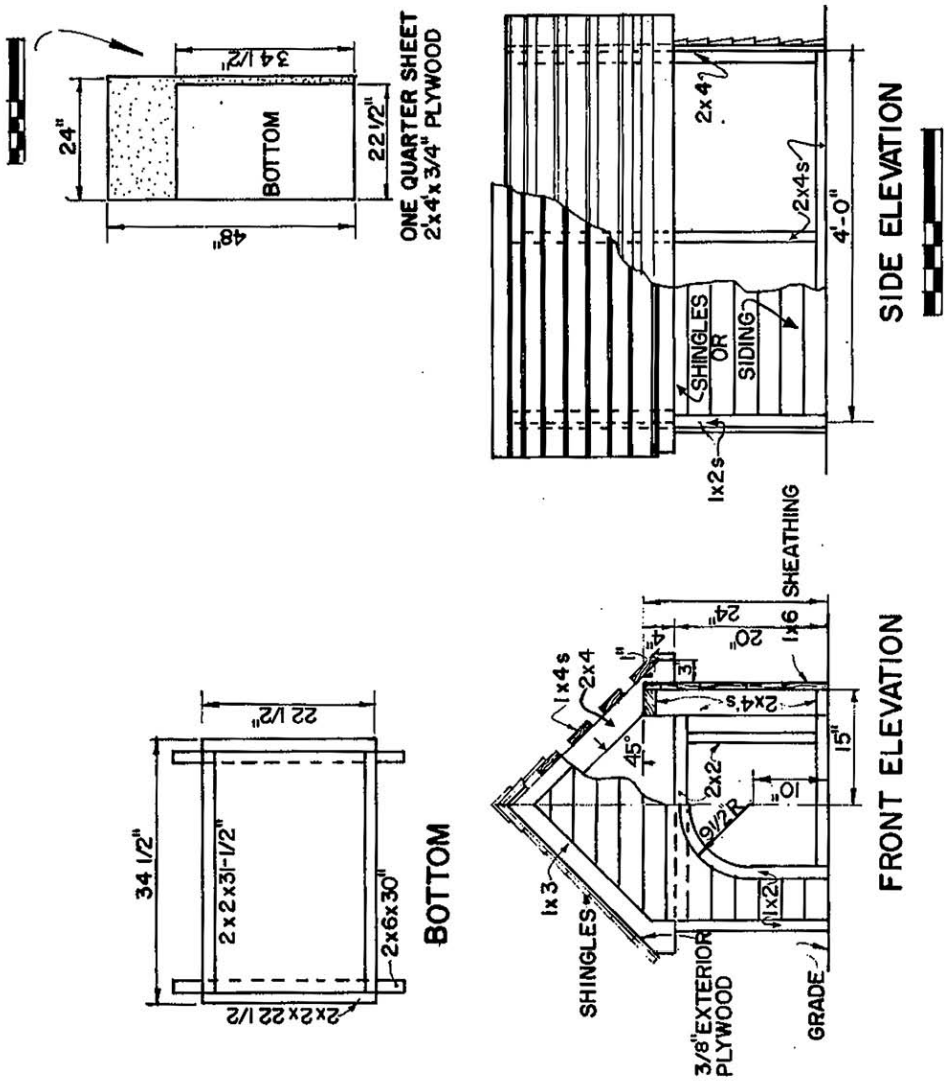
Dog House II

• Top, Front, & Side Views • Plywood Cutouts



Dog House III

• Front, Bottom, & Side Elevations • Plywood Cutouts



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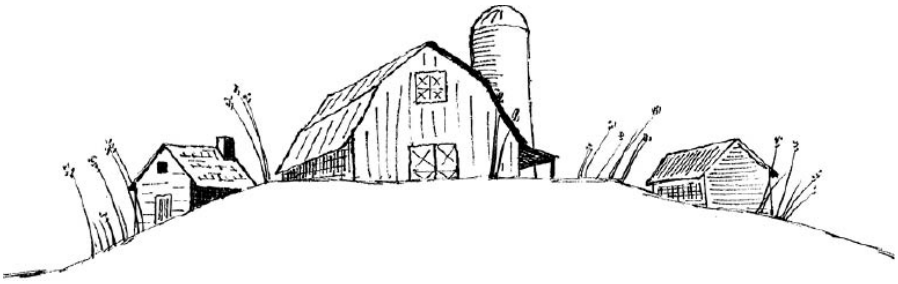


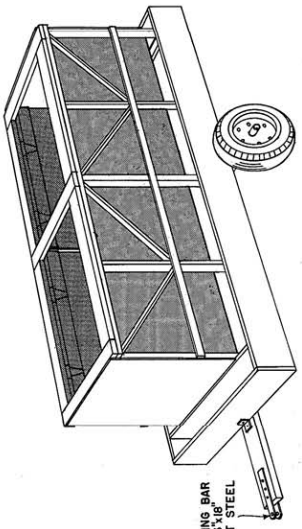
Chapter 7: Feeders

Plans Include:

- Two-Wheel Self-Feeder for Cattle
- Moveable Calf Creep Feeder
- Mineral Feeder for Cattle
- Mineral Feeder for Sheep
- Fence Line Sheep Feeder
- Self-Feeder for Hogs

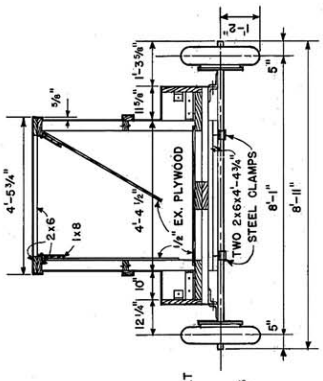
Two Wheel Self-Feeder for Cattle

• Perspective View • Top View • Side View • Section A-A

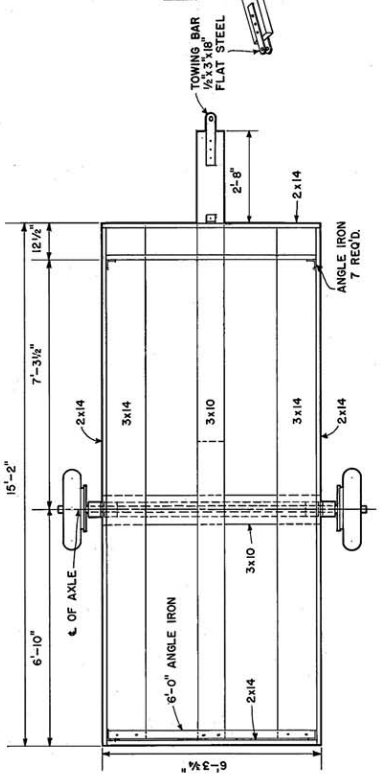


PERSPECTIVE

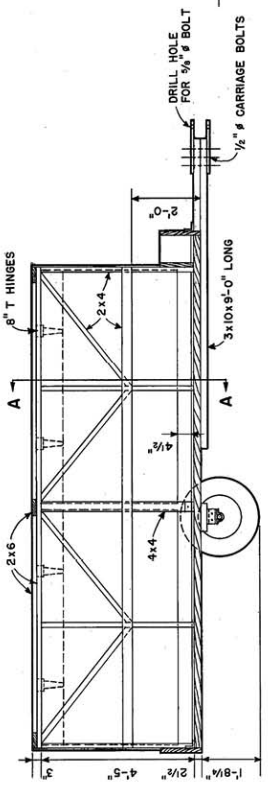
CONSTRUCTION DETAILS MAY BE MODIFIED TO USE LUMBER AT HAND.
JOINTS SHOULD BE WELL NAILED. BOLT THE METAL ANGLE IRON.
THIS CONSTRUCTION CAN BE ADAPTED FOR TRAILER MOUNTING, SKIDS, OR PERMANENT, IN-PLACE FEEDERS.



SECTION A-A



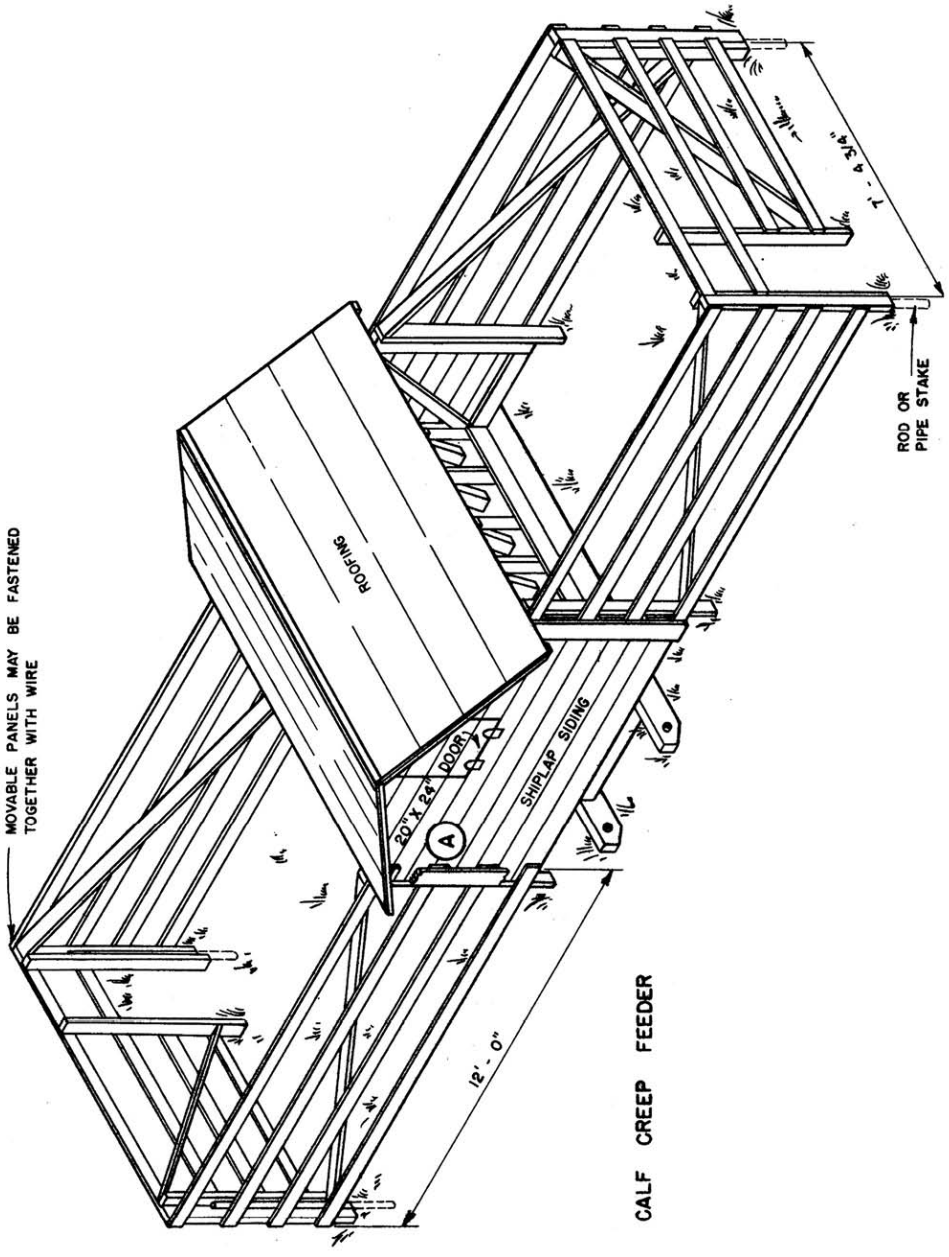
TOP VIEW OF BED FRAME



SIDE VIEW WITH THE 2x14 BOARD OFF

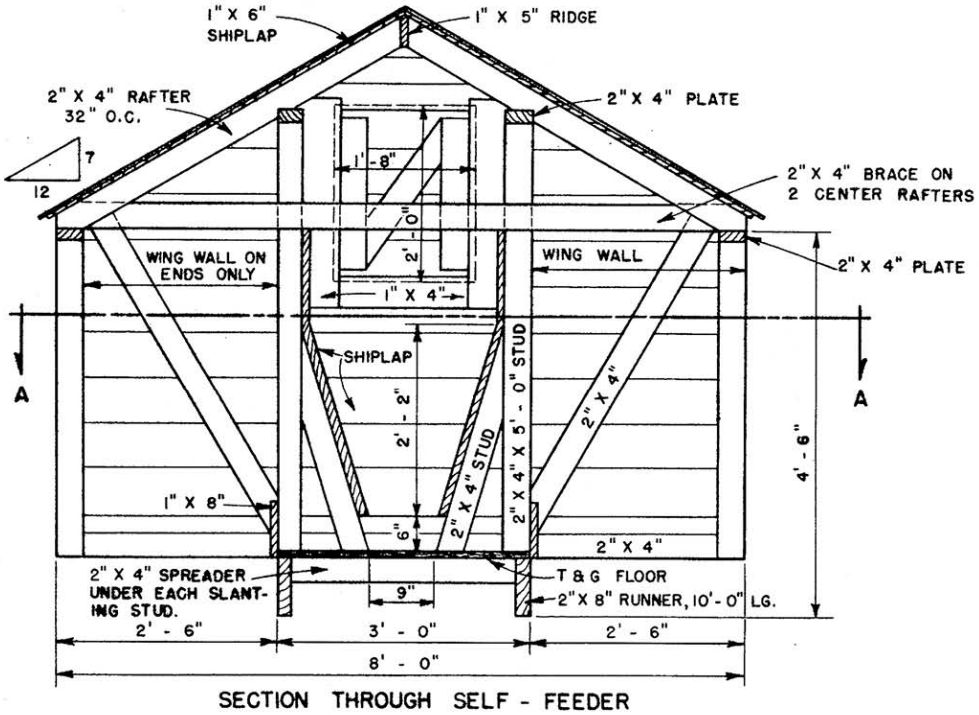
Moveable Calf Creep Feeder

- Perspective View



MOVEABLE CALF CREEP FEEDER

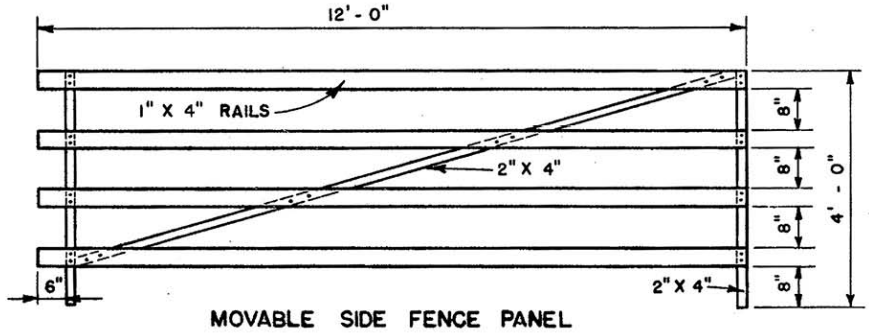
• Section Through Self-Feeder • Moveable Side Fence Panel



SECTION THROUGH SELF - FEEDER

NOTE

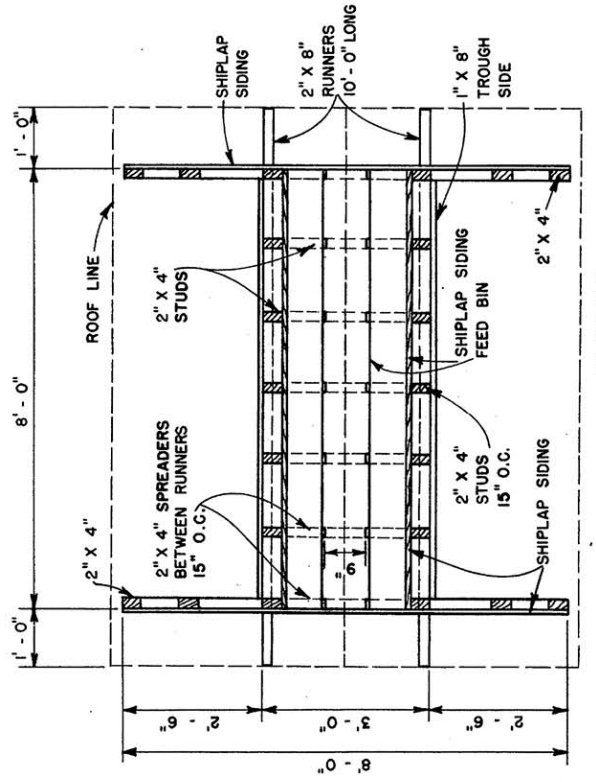
RUNNERS, PANEL POSTS & BOTTOM RAIL OF PANEL TO BE TREATED WITH PRESERVATIVE.
WIRE FENCE PANELS TO OLD ROD OR PIPE STAKES AT FOUR CORNERS.



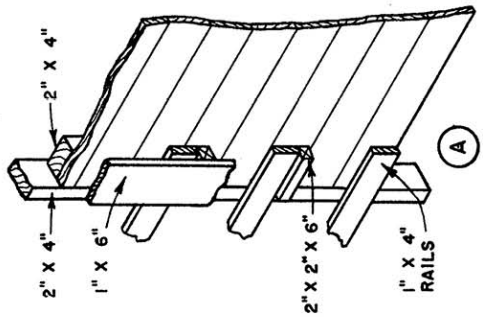
MOVABLE SIDE FENCE PANEL

MOVEABLE CALF CREEP FEEDER

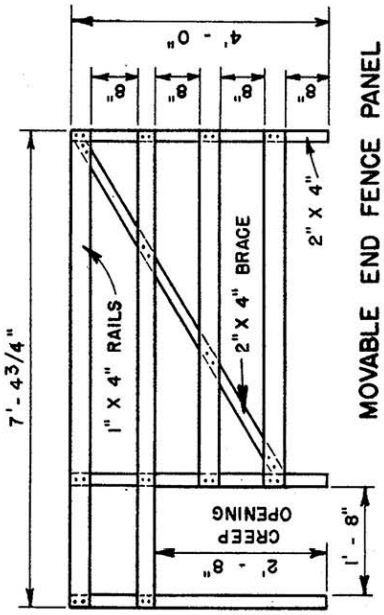
• Panel Detail at Corner • Plan A-A • Moveable End Fence Panel



PLAN A-A



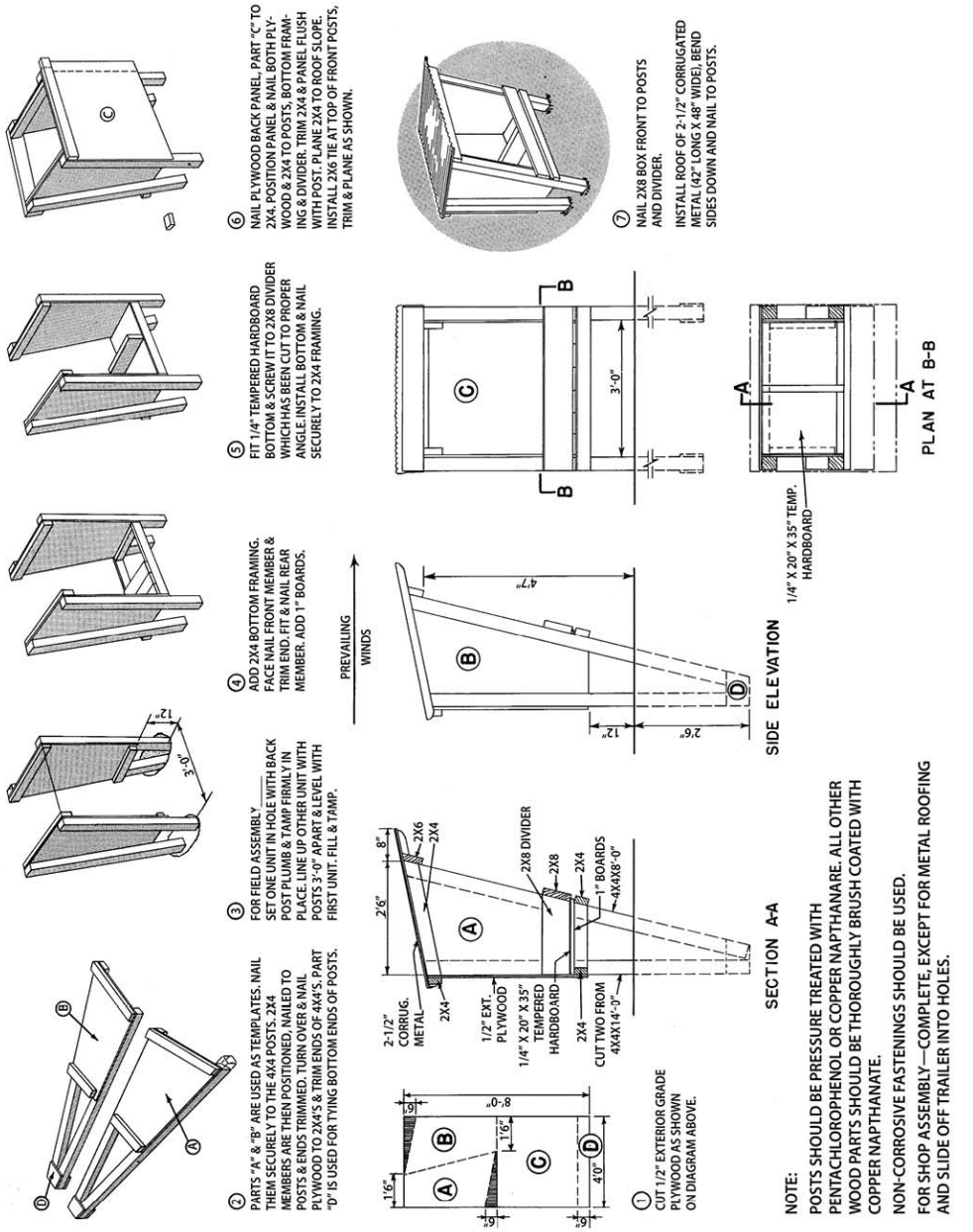
PANEL DETAIL AT CORNER OF BUILDING



MOVABLE END FENCE PANEL

MINERAL FEEDER FOR CATTLE

• Section A-A • Side Elevation • Plan B-B


① CUT 1/2" EXTERIOR GRADE PLYWOOD AS SHOWN ON DIAGRAM ABOVE.
② PARTS "A" & "B" ARE USED AS TEMPLATES. NAIL THEM SECURELY TO THE 4X4 POSTS. 2X4 MEMBERS ARE THEN POSITIONED, NAILED TO POSTS & ENDS TRIMMED. TURN OVER & NAIL PLYWOOD TO 2X4'S & TRIM ENDS OF 4X4'S. PART "D" IS USED FOR TYING BOTTOM ENDS OF POSTS.
③ FOR FIELD ASSEMBLY SET ONE UNIT IN HOLE WITH BACK POST PLUMB & TAMP FIRMLY IN PLACE. LINE UP OTHER UNIT WITH POSTS 3'-0" APART & LEVEL WITH FIRST UNIT. FILL & TAMP.
④ ADD 2X4 BOTTOM FRAMING. FACE NAIL FRONT MEMBER & TRIM END. FIT & NAIL REAR MEMBER. ADD 1" BOARDS.
⑤ FIT 1/4" TEMPERED HARDBOARD BOTTOM & SCREW IT TO 2X8 DIVIDER WHICH HAS BEEN CUT TO PROPER ANGLE. INSTALL BOTTOM & NAIL SECURELY TO 2X4 FRAMING.
⑥ NAIL PLYWOOD BACK PANEL, PART "C" TO 2X4. POSITION PANEL & NAIL BOTH PLYWOOD & 2X4 TO POSTS, BOTTOM FRAMING & DIVIDER. TRIM 2X4 & PANEL FLUSH WITH POST. PLANE 2X4 TO ROOF SLOPE. INSTALL 2X6 TIE AT TOP OF FRONT POSTS, TRIM & PLANE AS SHOWN.
⑦ NAIL 2X8 BOX FRONT TO POSTS AND DIVIDER.
INSTALL ROOF OF 2-1/2" CORRUGATED METAL (42" LONG X 48" WIDE), BEND SIDES DOWN AND NAIL TO POSTS.
PREVAILING WINDS
SECTION A-A
SIDE ELEVATION
PLAN AT B-B
2-1/2" CORRUG. METAL
2X4
2X6
2X4
2X8 DIVIDER
2X8
2X4
1" BOARDS 4X4X8'-0"
1/2" EXT. PLYWOOD
1/4" X 20" X 35" TEMPERED HARDBOARD
2X4
CUT TWO FROM 4X4X14'-0"
1/4" X 20" X 35" TEMP. HARDBOARD
3'-0"
4'7"
2'6"
12"

NOTE:

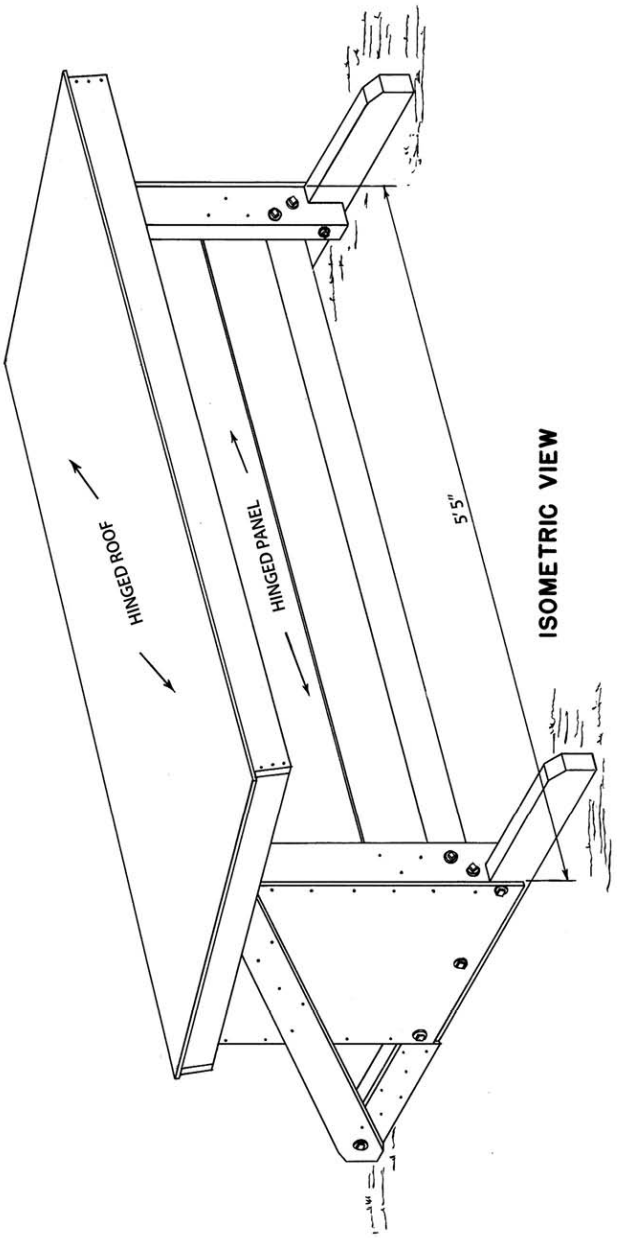
POSTS SHOULD BE PRESSURE TREATED WITH PENTACHLOROPHENOL OR COPPER NAPTHANARE. ALL OTHER WOOD PARTS SHOULD BE THOROUGHLY BRUSH COATED WITH COPPER NAPTHANATE.

NON-CORROSIVE FASTENINGS SHOULD BE USED.

FOR SHOP ASSEMBLY—COMPLETE, EXCEPT FOR METAL ROOFING AND SLIDE OFF TRAILER INTO HOLES.

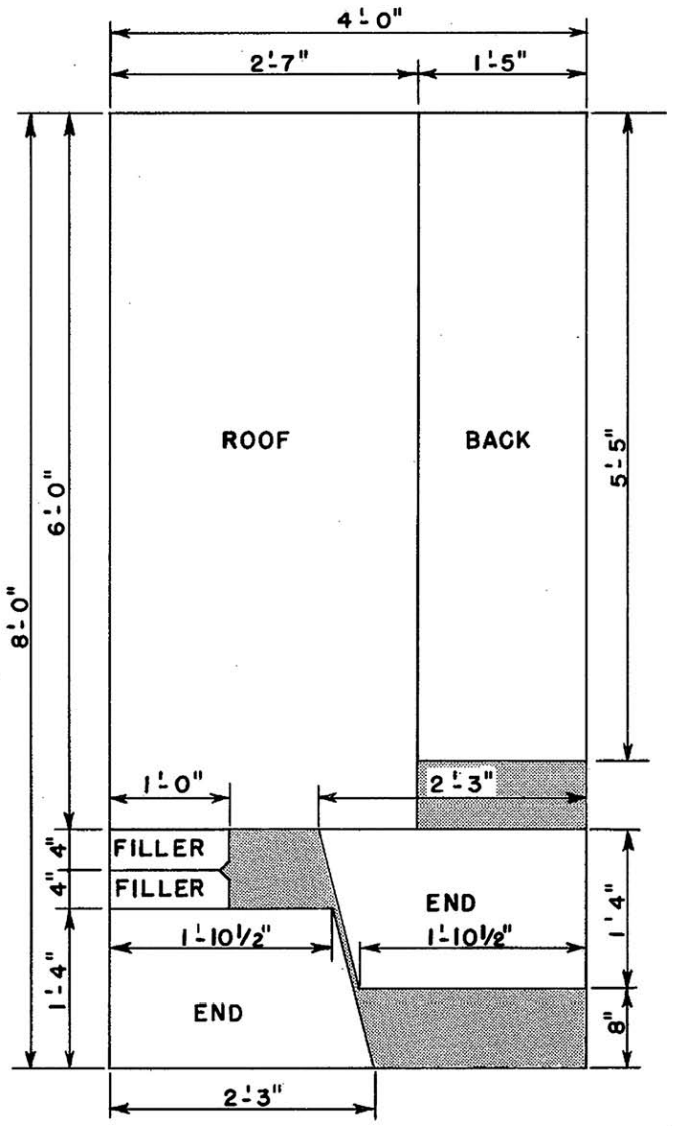
MINERAL FEEDER FOR SHEEP

- Isometric View



MINERAL FEEDER FOR SHEEP

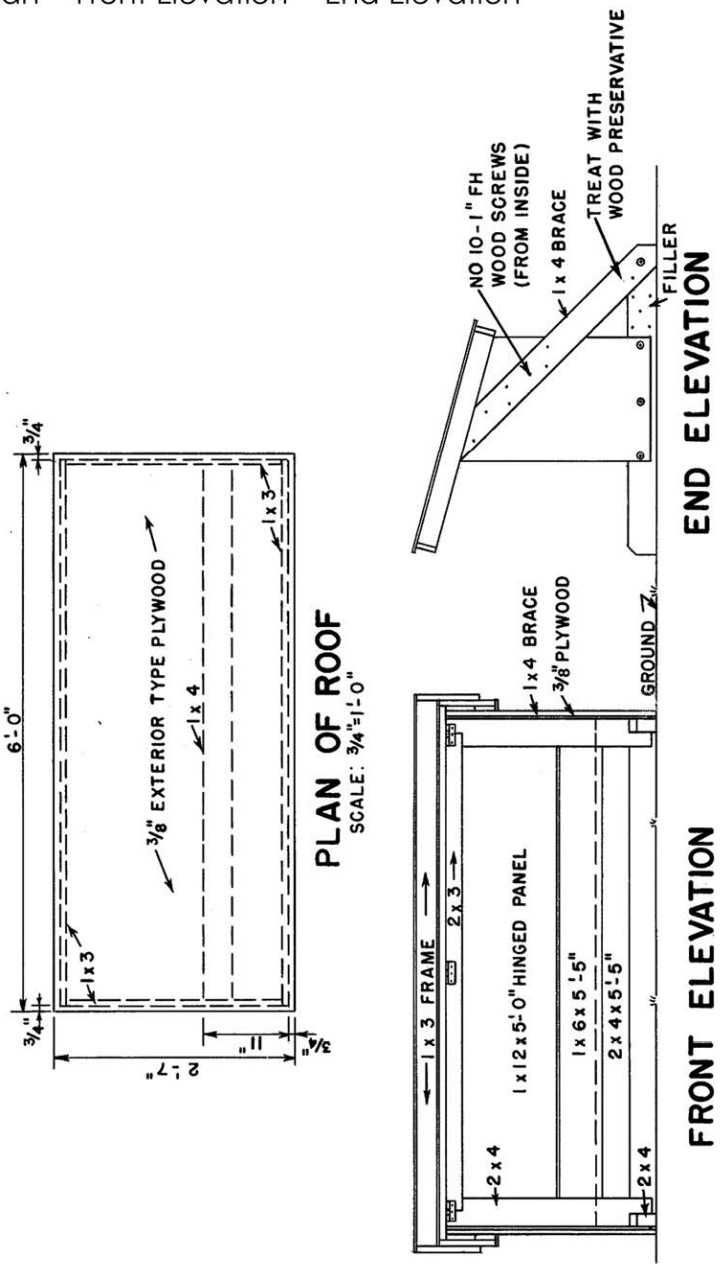
- Cutting Diagram



CUTTING DIAGRAM
(3/8" EXTERIOR TYPE PLYWOOD)

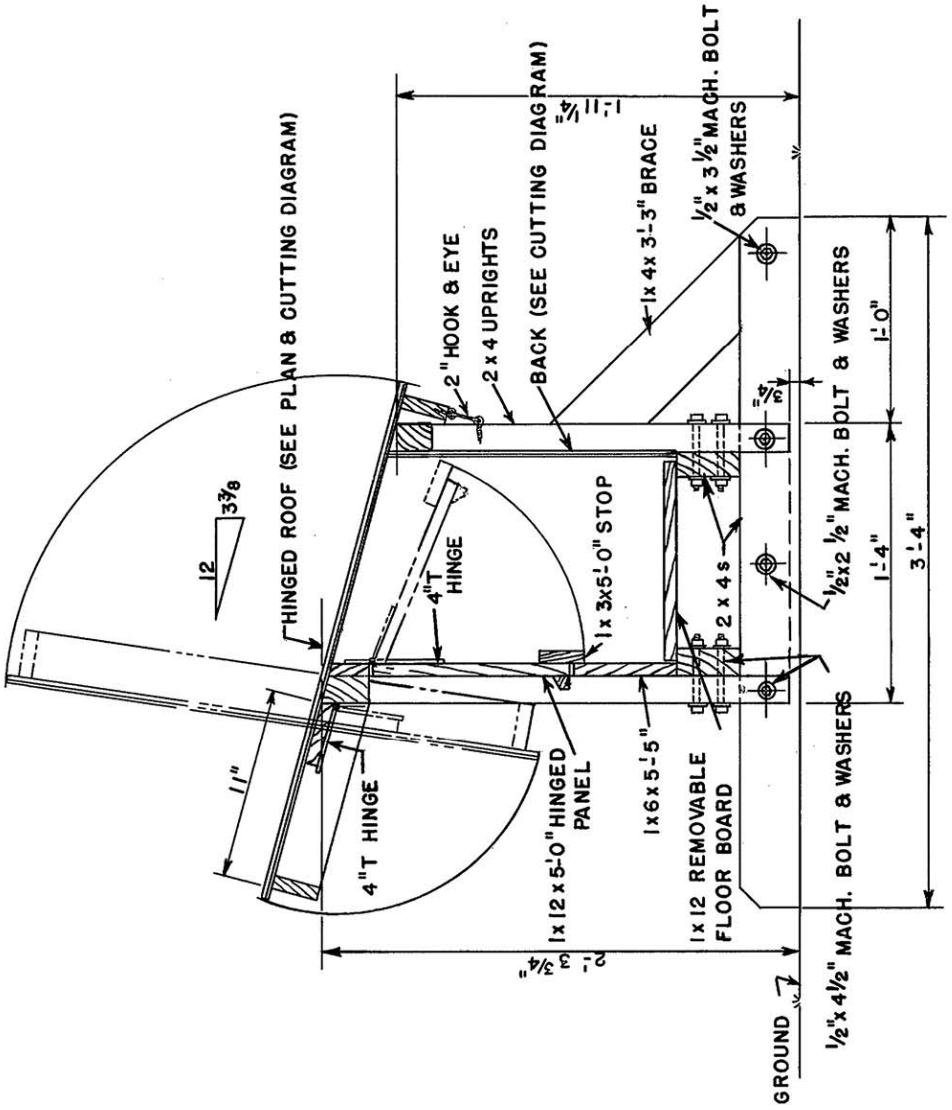
Mineral Feeder for Sheep

• Roof Plan • Front Elevation • End Elevation



Mineral Feeder for Sheep

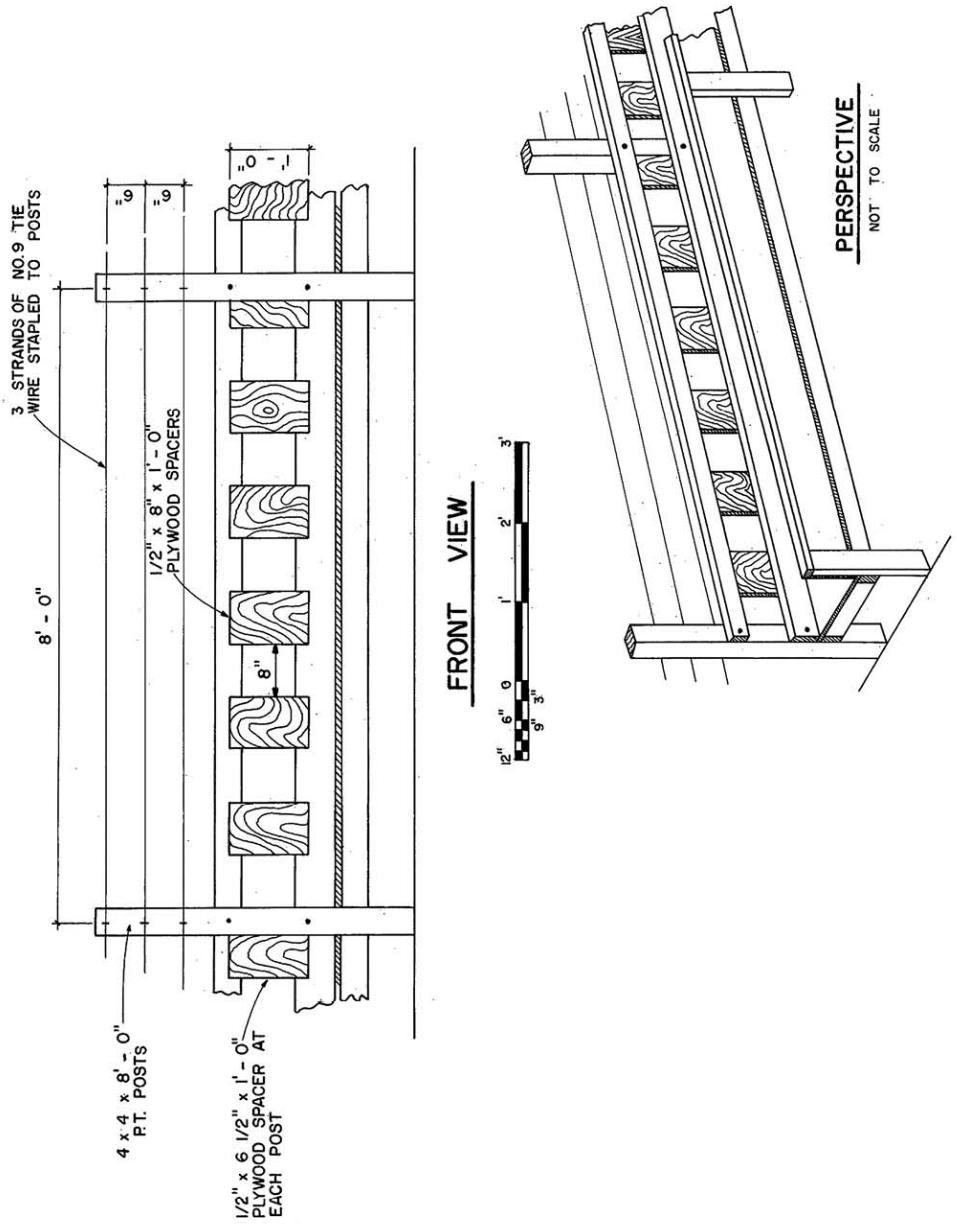
- Section A-A



SECTION A-A

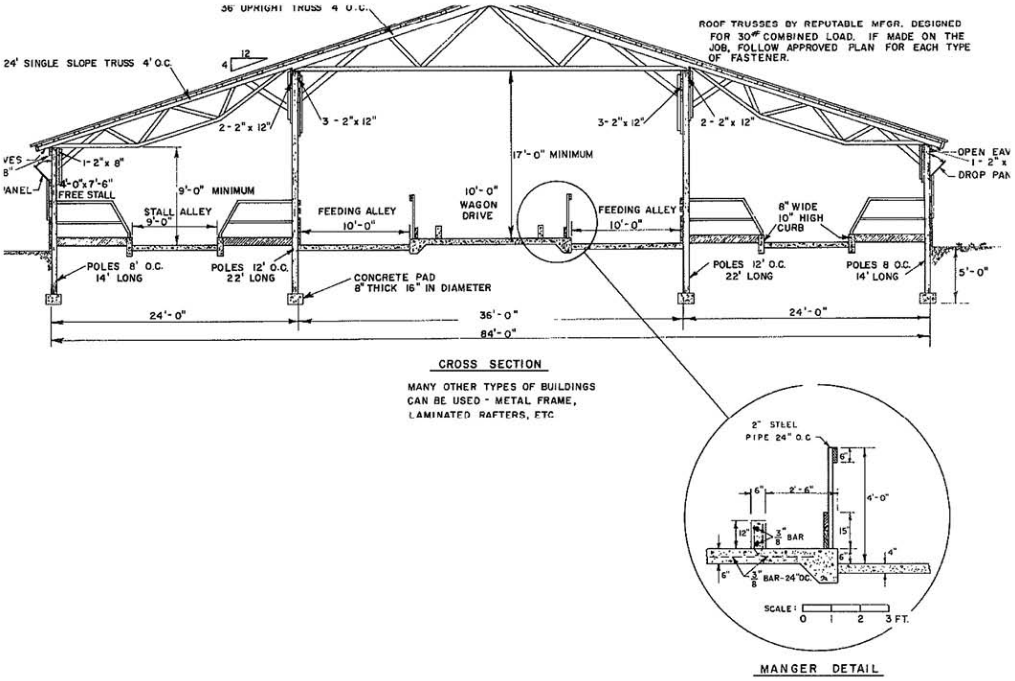
Fence Line Sheep Feeder

• Front View • Perspective View


3 STRANDS OF NO.9 TIE WIRE STAPLED TO POSTS
8' - 0"
1/2" x 8" x 1' - 0" PLYWOOD SPACERS
8"
4 x 4 x 8' - 0" P.T. POSTS
1/2" x 6 1/2" x 1' - 0" PLYWOOD SPACER AT EACH POST
FRONT VIEW
PERSPECTIVE
NOT TO SCALE

FENCE LINE SHEEP FEEDER

- Cross Section


ROOF TRUSSES BY REPUTABLE MFGR. DESIGNED FOR 30# COMBINED LOAD. IF MADE ON THE JOB, FOLLOW APPROVED PLAN FOR EACH TYPE OF FASTENER.
24' SINGLE SLOPE TRUSS 4' O.C.
12
4
2 - 2" x 12"
3 - 2" x 12"
3 - 2" x 12"
2 - 2" x 12"
17'-0" MINIMUM
1 - 2" x 8"
4'-0" x 7'-6" FREE STALL
9'-0" MINIMUM
STALL ALLEY 9'-0"
FEEDING ALLEY 10'-0"
10'-0" WAGON DRIVE
FEEDING ALLEY 10'-0"
8" WIDE 10" HIGH CURB
OPEN EAV
1 - 2" x
DROP PAN
POLES 8' O.C. 14' LONG
POLES 12' O.C. 22' LONG
CONCRETE PAD 8" THICK 16" IN DIAMETER
POLES 12' O.C. 22' LONG
POLES 8 O.C. 14' LONG
5'-0"
24'-0"
36'-0"
24'-0"
84'-0"

CROSS SECTION

MANY OTHER TYPES OF BUILDINGS CAN BE USED - METAL FRAME, LAMINATED RAFTERS, ETC

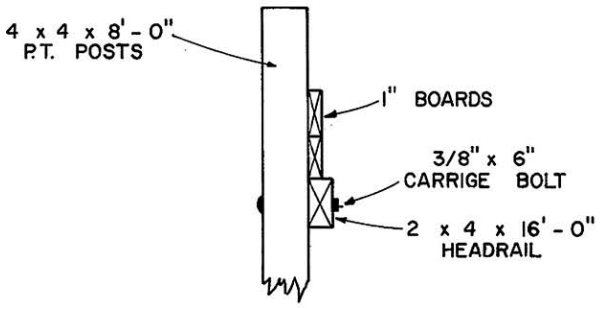
MANGER DETAIL

Fence Line Sheep Feeder

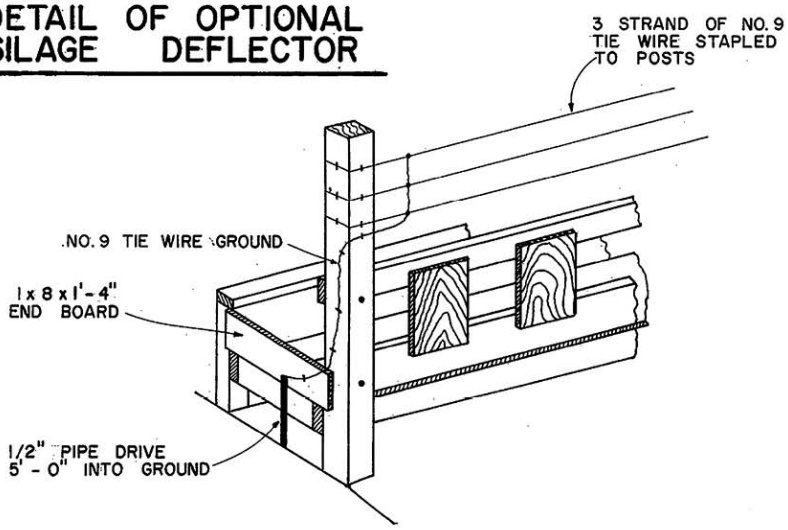
• Table of Feeder Height • Optional Silage Deflector

TABLE OF FEEDER HEIGHT

SHEEP SIZE	HEIGHT TO THROAT 'H'
SMALL BREEDS & FEEDER LAMBS	10" TO 1' - 6"
MEDIUM BREEDS	1' - 5" TO 1' - 8"
LARGE BREEDS	1' - 8" TO 1' - 10"



DETAIL OF OPTIONAL SILAGE DEFLECTOR

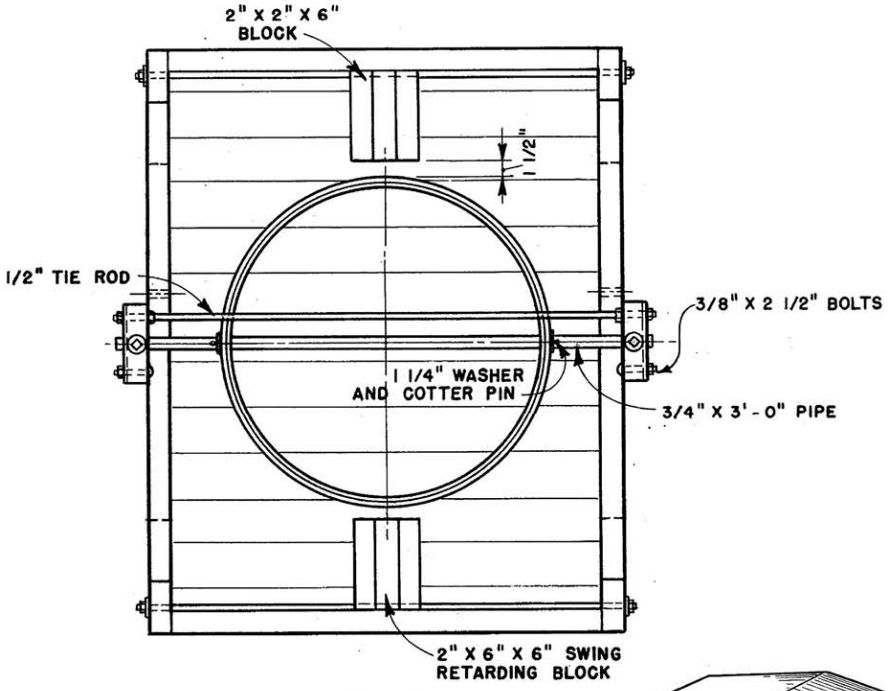


END VIEW

NOT TO SCALE

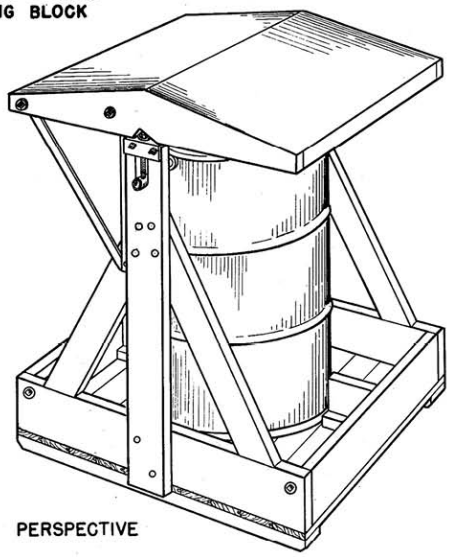
Self-Feeder for Hogs

• Plan • Perspective View



PLAN

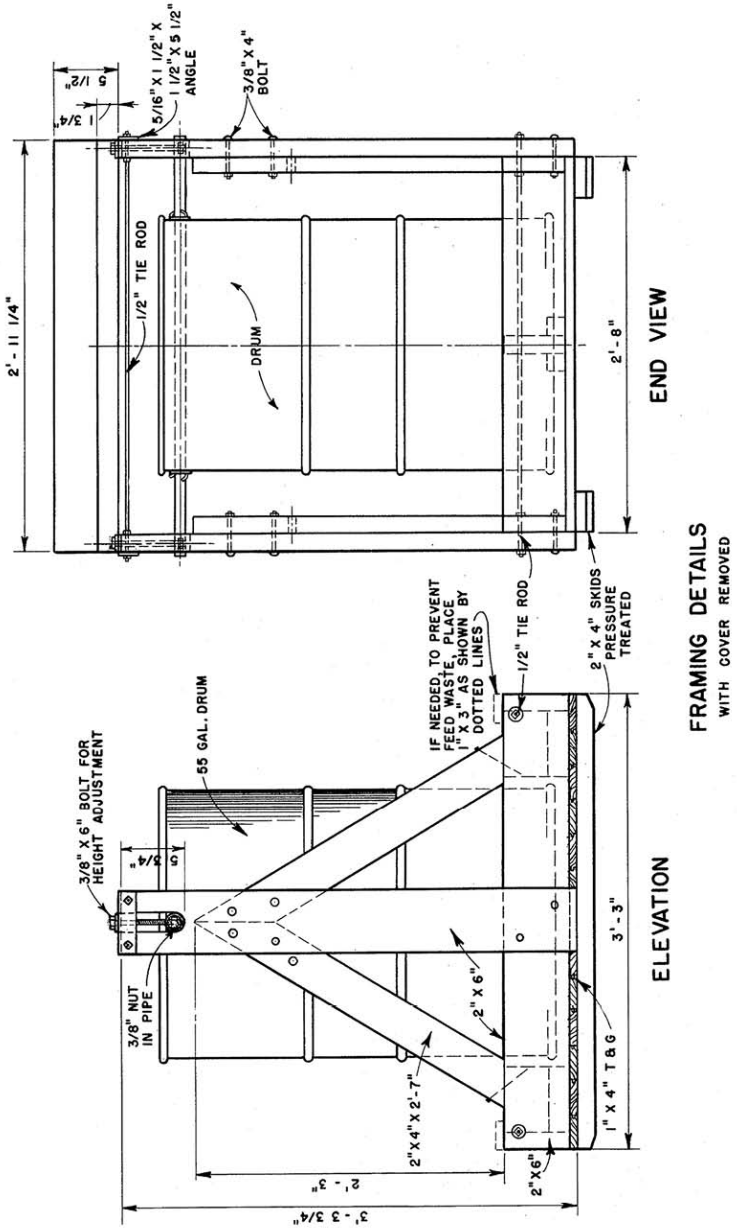
COVER NOT SHOWN



PERSPECTIVE

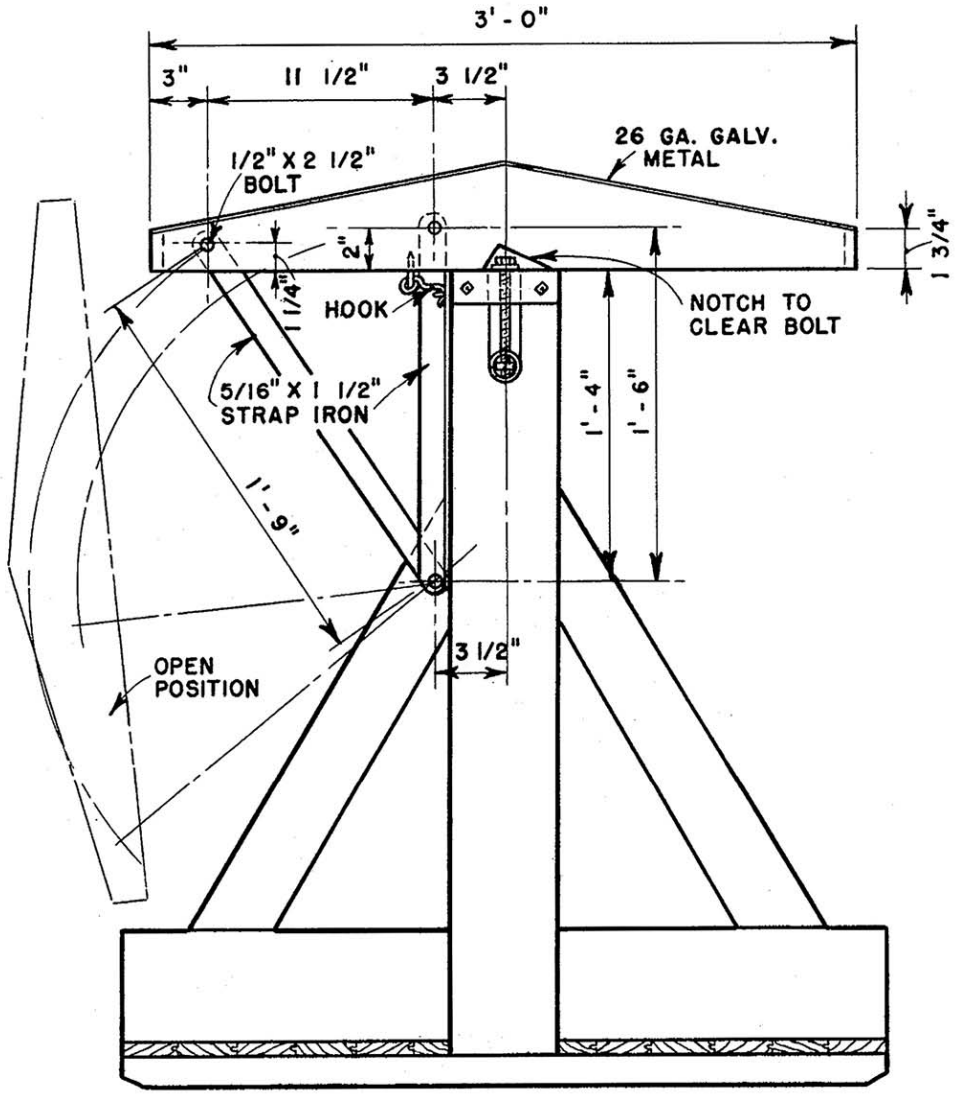
SELF-FEEDER FOR HOGS

- Framing Details



SELF-FEEDER FOR HOGS

- Cover Detail



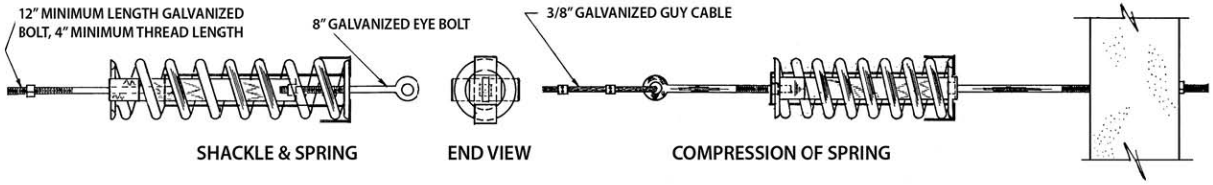
COVER DETAIL
SHOWING FIT

[Table of Contents]

Chapter 8: Fences & Gates

Plans Include:

- Cable Fencing
- Wooden Fence Types I
- Wooden Fence Types II
- Wooden Fence Types III
- Farm Gate Type A
- Farm Gate Type B
- Farm Gate Parts I
- Farm Gate Parts II
- Variable Clearance Gate
- Automatic Gate
- Telescoping Type Gate
- Pasture Creep Gate
- Pasture Creep Gate Type I
- Pasture Creep Gate Type II
- Walk-Through Head Gate

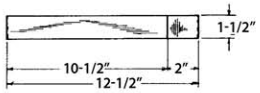


SHACKLE & SPRING

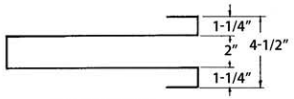
END VIEW

COMPRESSION OF SPRING

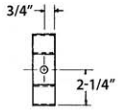
NOTE:
SHACKLES SHOULD SHOULD NOT BE MADE TILL AFTER SPRINGS ARE SECURED



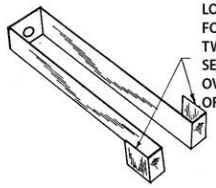
TOP VIEW



FRONT VIEW



END VIEW

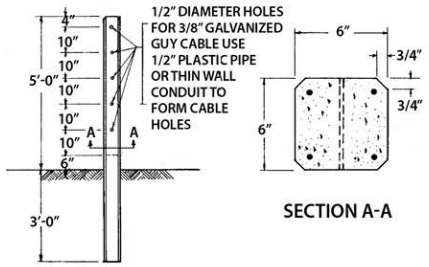


THE LEG OF SHACKLE SHOULD BE LONG ENOUGH TO COMPENSATE FOR THE SHAPE OF THE SPRING. TWO SHACKLES REQUIRED PER SPRING. SECOND SHACKLE MUST BE FORMED OVER SPRING END AFTER INSTALLATION OF THE FIRST SHACKLE

SHACKLE

NOTE:
1/2" GALVANIZED EYE BOLTS FOR USE ON END POSTS

NOTE:
USE CONCRETE POST OR 6" TOP DIAMETER PRESSURE TREATED POST



CONCRETE POST

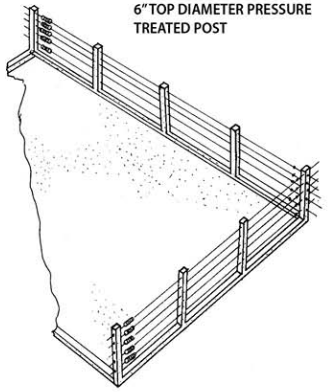
SECTION A-A

NOTE:
OUTSIDE DIAMETER OF AUTOMOBILE SPRING FROM SALVAGE SHOULD BE A MINIMUM OF 4"

NOTE:
4 NO. 3(3/8") RE-BARS PLACED IN THE CORNERS AND COVERED WITH A MINIMUM OF 3/4" OF CONCRETE AT ALL POINTS.

THE LARGEST SIZE AGGREGATE SHOULD BE 1/2"

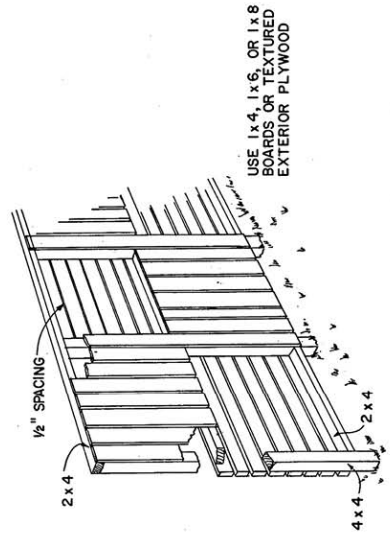
BEVEL CORNERS BY PLACING 1/2" TRIANGULAR STRIP IN FORM



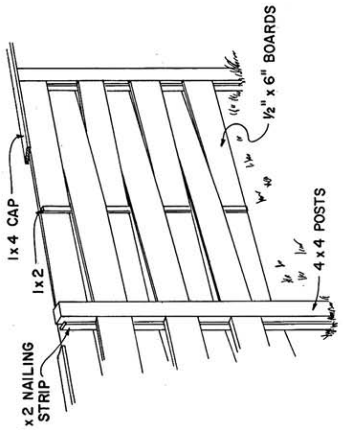
PERSPECTIVE

WOODEN FENCE TYPES I

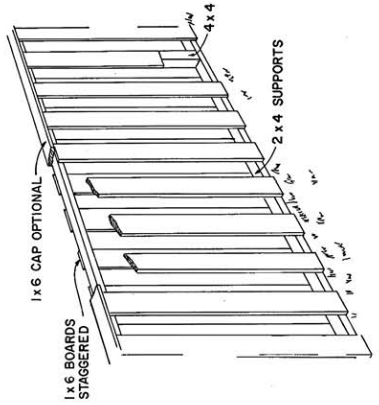
- Alternate Board Fence • Novelty Pattern • Louvered Fence
- Basket Weave Fence



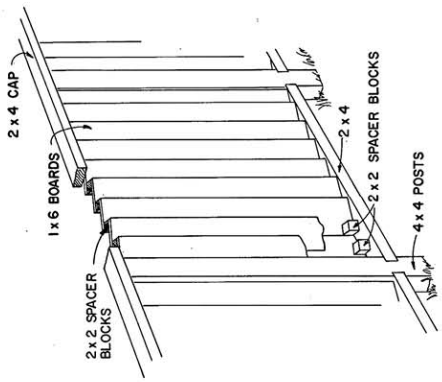
NOVELTY PATTERN



BASKET WEAVE FENCE



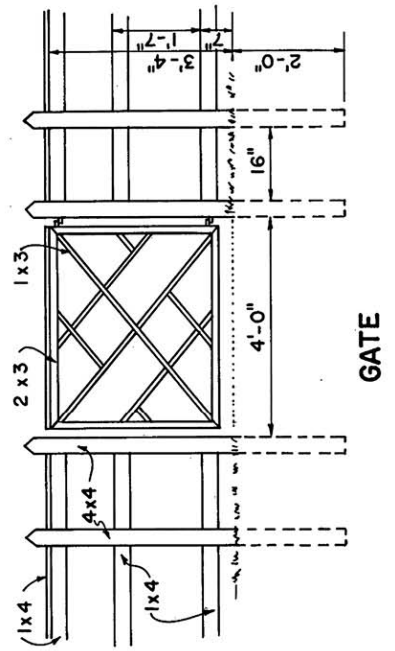
ALTERNATE BOARD FENCE



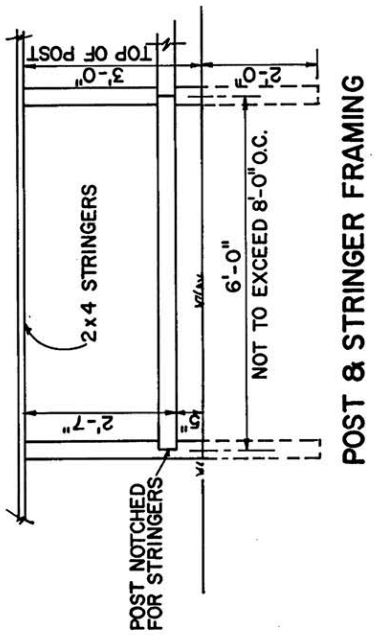
LOUVERED FENCE

WOODEN FENCE TYPES II

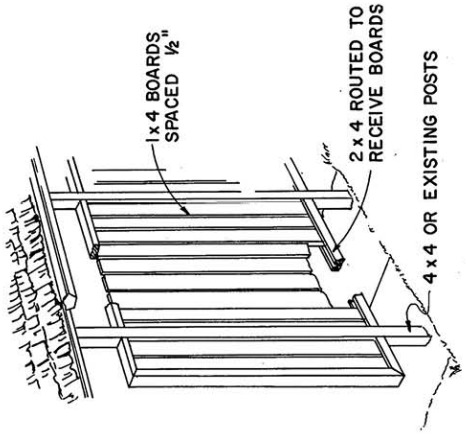
• Privacy Screen • Gate • Low Rail Fence • Post & Stringer Framing



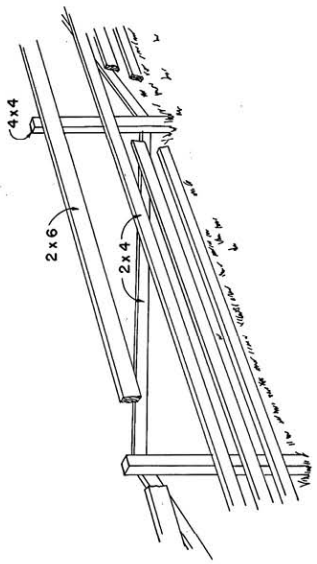
GATE



POST & STRINGER FRAMING



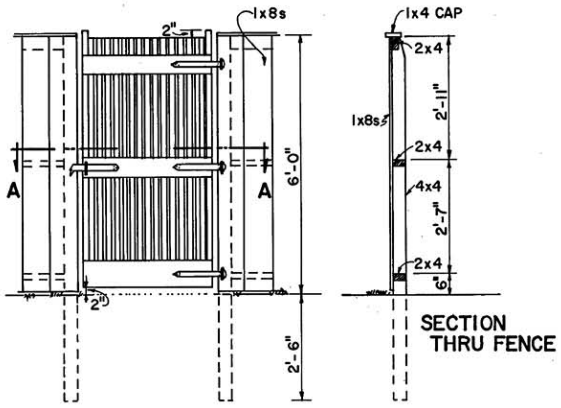
PRIVACY SCREEN



LOW RAIL FENCE

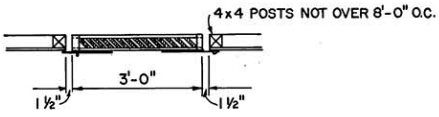
WOODEN FENCE TYPES III

• Louvered Gate • Stretcher Fence

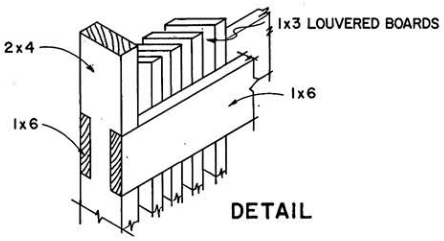


SECTION THRU FENCE

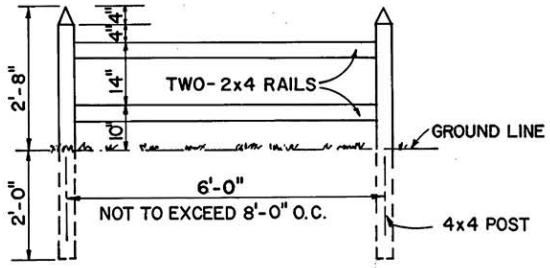
LOUVERED GATE



SECTION "A-A"

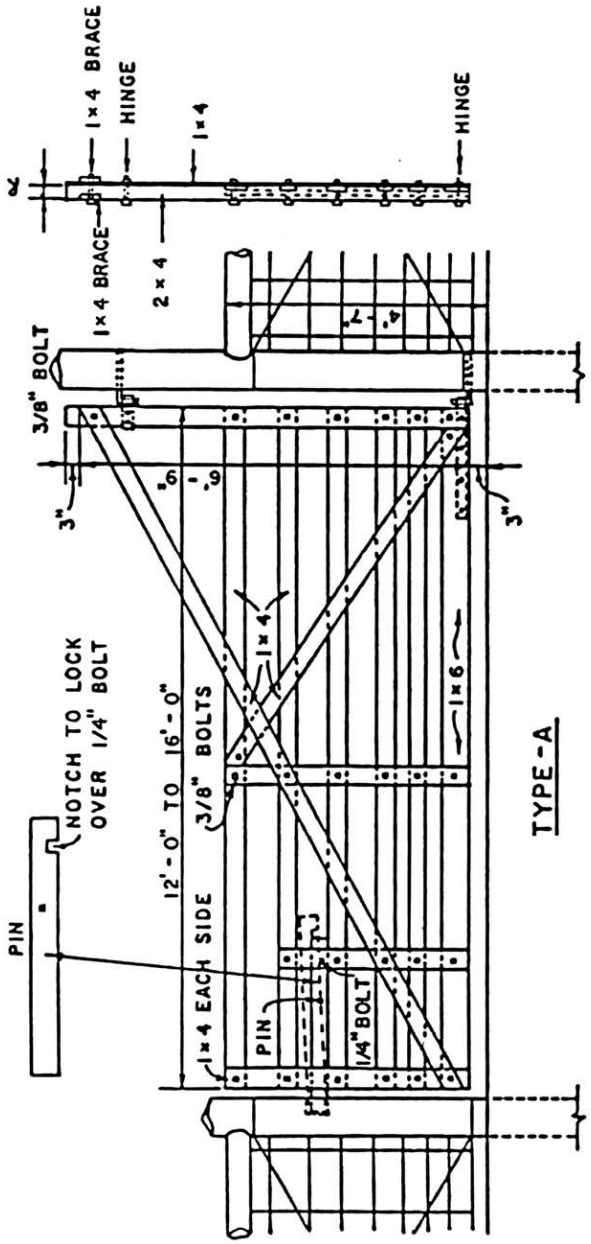


DETAIL

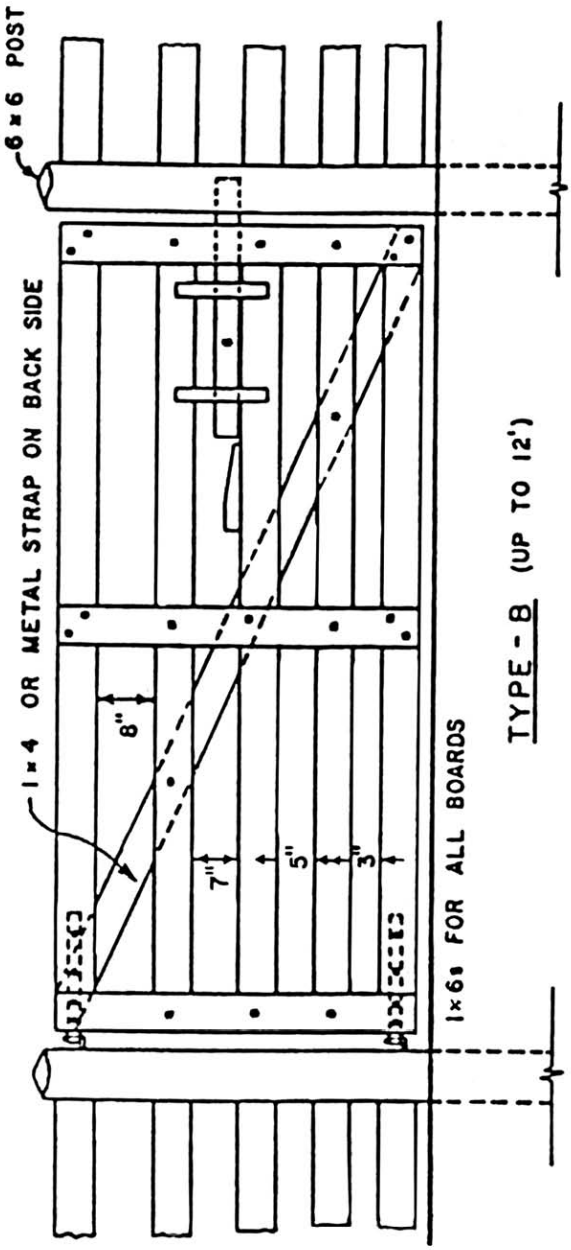


STRETCHER FENCE

Farm Gate Type A

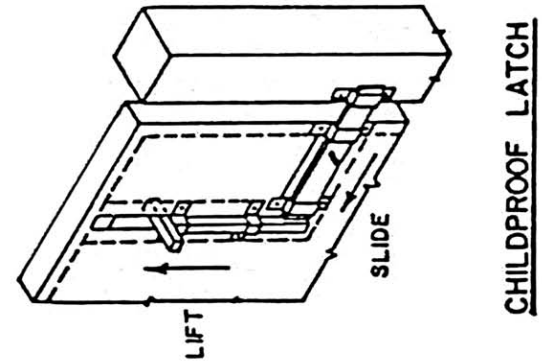


Farm Gate Type B

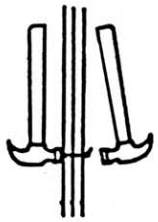


FARM GATE PARTS I

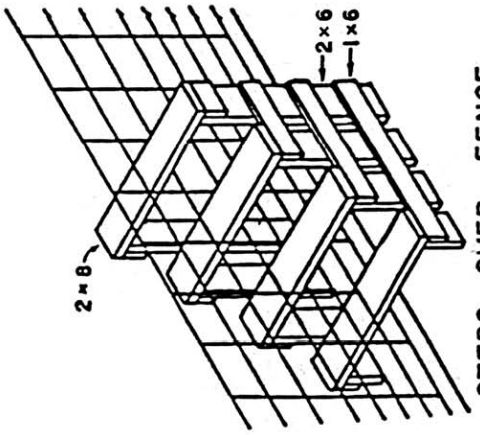
• Steps Over Fence • Childproof Latch • Fence Passage



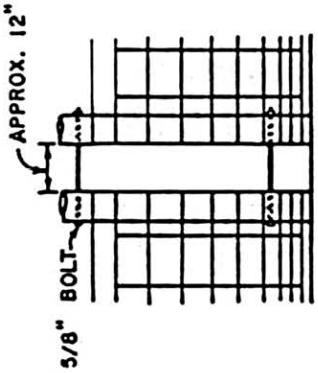
CHILDPROOF LATCH



NOTE: "CLINCHED NAILS" MAY BE USED INSTEAD OF BOLTS TO CONNECT 1×6 BOARDS. (AT LEAST THREE 8d OR 6d NAILS PER BOLT.)



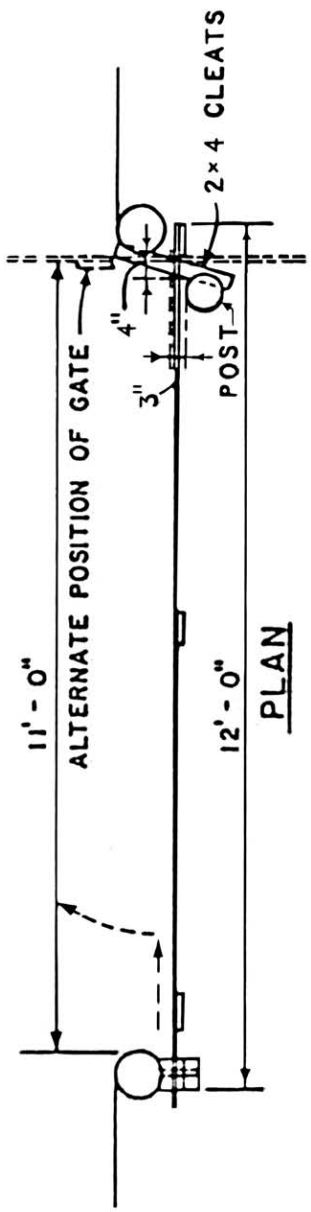
STEPS OVER FENCE



FENCE PASSAGE

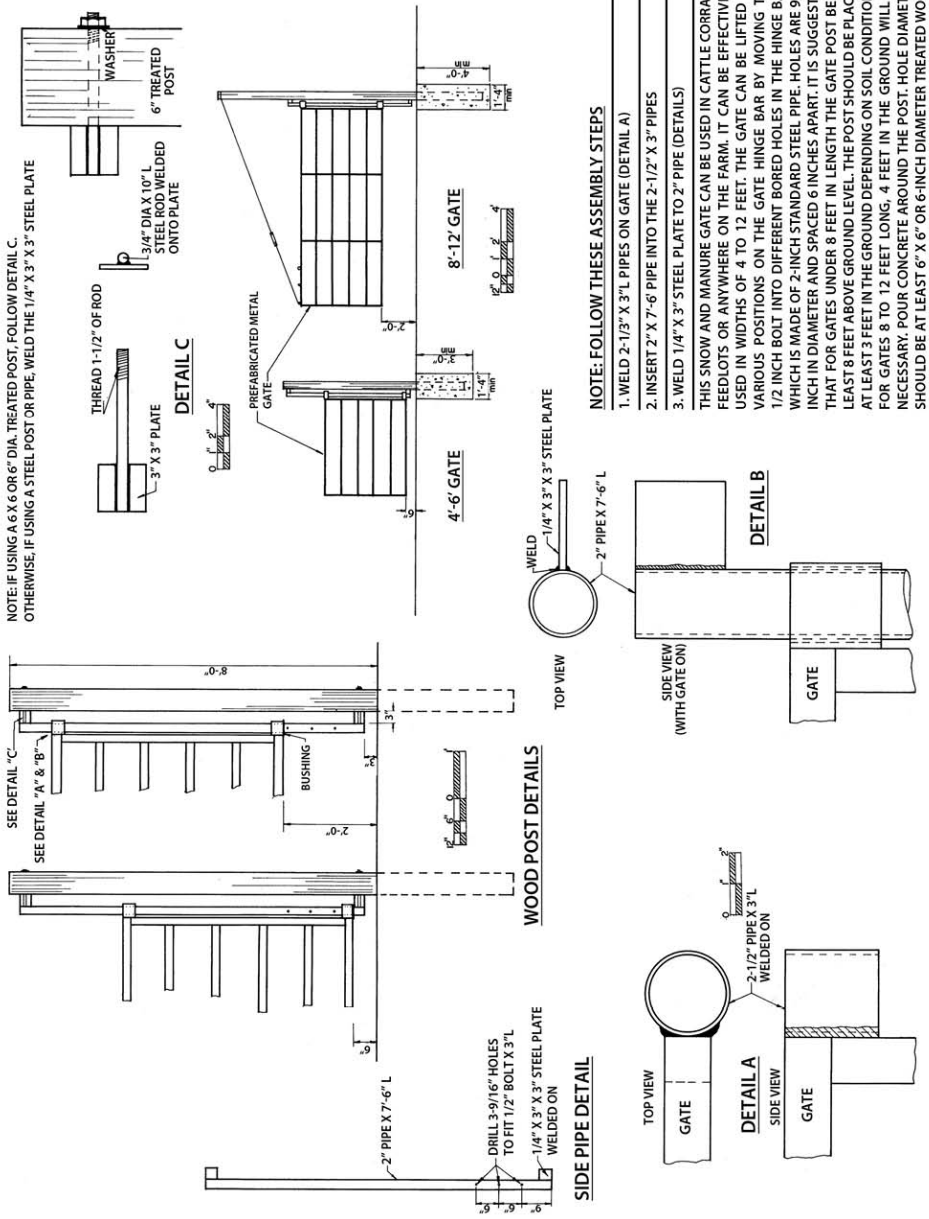
Farm Gate Parts II

- Plans



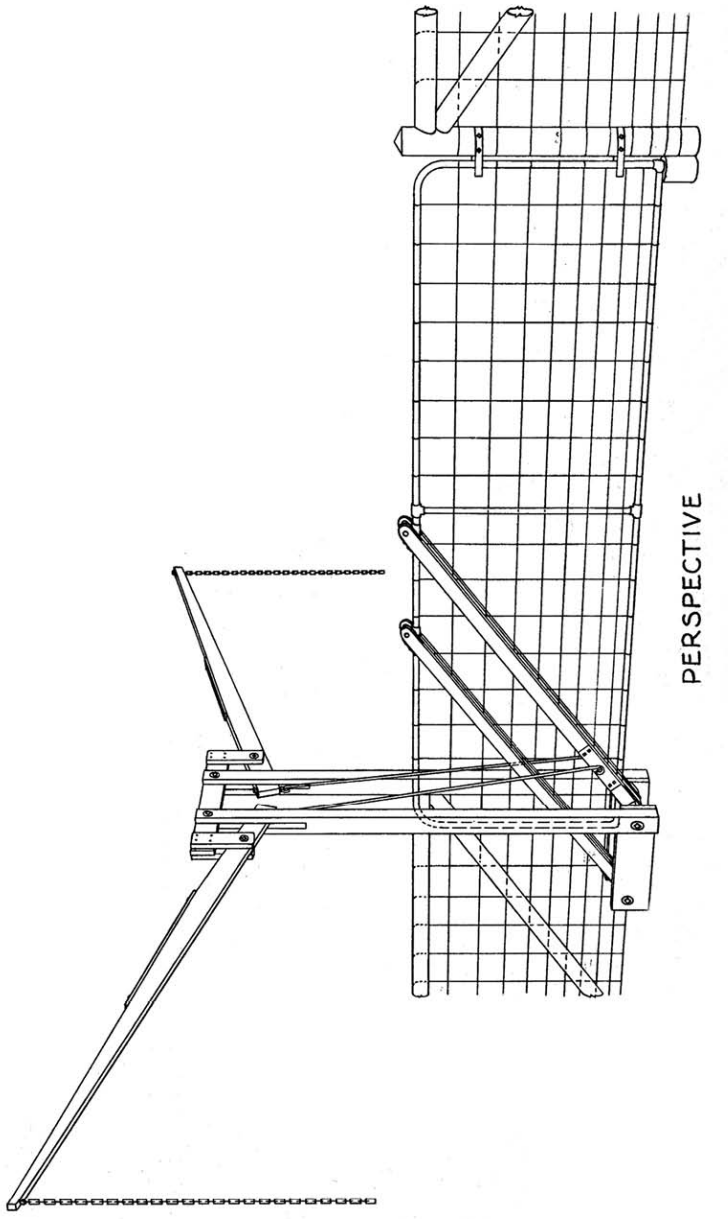
VARIABLE CLEARANCE GATE

- Plan


NOTE: IF USING A 6 X 6 OR 6" DIA. TREATED POST, FOLLOW DETAIL C.
OTHERWISE, IF USING A STEEL POST OR PIPE, WELD THE 1/4" X 3" X 3" STEEL PLATE
WASHER
6" TREATED POST
3/4" DIA X 10" L STEEL ROD WELDED ONTO PLATE
THREAD 1-1/2" OF ROD
3" X 3" PLATE
DETAIL C
PREFABRICATED METAL GATE
8'-12' GATE
4'-6' GATE
NOTE: FOLLOW THESE ASSEMBLY STEPS
1. WELD 2-1/3" X 3"L PIPES ON GATE (DETAIL A)
2. INSERT 2" X 7'-6" PIPE INTO THE 2-1/2" X 3" PIPES
3. WELD 1/4" X 3" STEEL PLATE TO 2" PIPE (DETAILS)
THIS SNOW AND MANURE GATE CAN BE USED IN CATTLE CORRALS, FEEDLOTS OR ANYWHERE ON THE FARM. IT CAN BE EFFECTIVELY USED IN WIDTHS OF 4 TO 12 FEET. THE GATE CAN BE LIFTED TO VARIOUS POSITIONS ON THE GATE HINGE BAR BY MOVING THE 1/2 INCH BOLT INTO DIFFERENT BORED HOLES IN THE HINGE BAR, WHICH IS MADE OF 2-INCH STANDARD STEEL PIPE. HOLES ARE 9/16 INCH IN DIAMETER AND SPACED 6 INCHES APART. IT IS SUGGESTED THAT FOR GATES UNDER 8 FEET IN LENGTH THE GATE POST BE AT LEAST 8 FEET ABOVE GROUND LEVEL. THE POST SHOULD BE PLACED AT LEAST 3 FEET IN THE GROUND DEPENDING ON SOIL CONDITIONS. FOR GATES 8 TO 12 FEET LONG, 4 FEET IN THE GROUND WILL BE NECESSARY. POUR CONCRETE AROUND THE POST. HOLE DIAMETER SHOULD BE AT LEAST 6" X 6" OR 6-INCH DIAMETER TREATED WOOD POST OR 6-INCH DIAMETER STANDARD STEEL PIPE POST. FOR WIDER GATES (8-12 FEET), THE GATE POST SHOULD EXTEND 12 FEET ABOVE THE GROUND LEVEL SO THAT A STEEL CABLE WITH A TURN BUCKLE CAN BE USED TO ADJUST GATE LEVEL FOR EASIER OPERATION.
WELD
1/4" X 3" X 3" STEEL PLATE
2" PIPE X 7'-6" L
TOP VIEW
SIDE VIEW (WITH GATE ON)
DETAIL B
GATE
SEE DETAIL "C"
SEE DETAIL "A" & "B"
BUSHING
WOOD POST DETAILS
2" PIPE X 7'-6" L
DRILL 3-9/16" HOLES TO FIT 1/2" BOLT X 3"L
1/4" X 3" X 3" STEEL PLATE WELDED ON
SIDE PIPE DETAIL
TOP VIEW
GATE
2-1/2" PIPE X 3"L WELDED ON
DETAIL A
SIDE VIEW
GATE

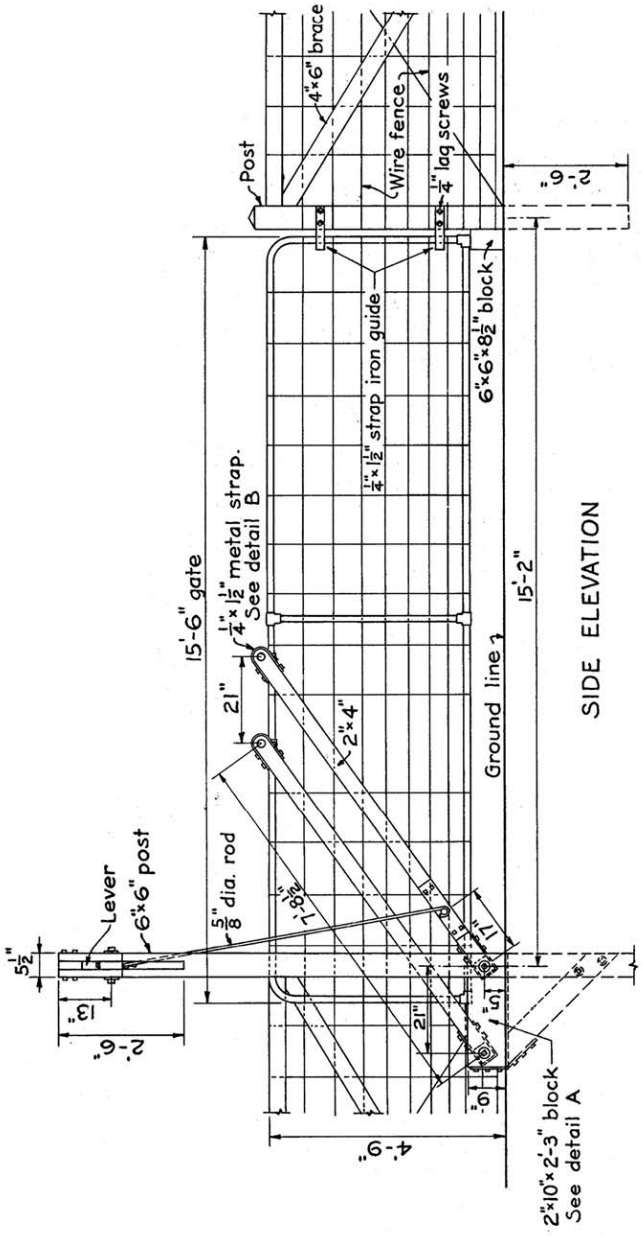
AUTOMATIC GATE

- Perspective View



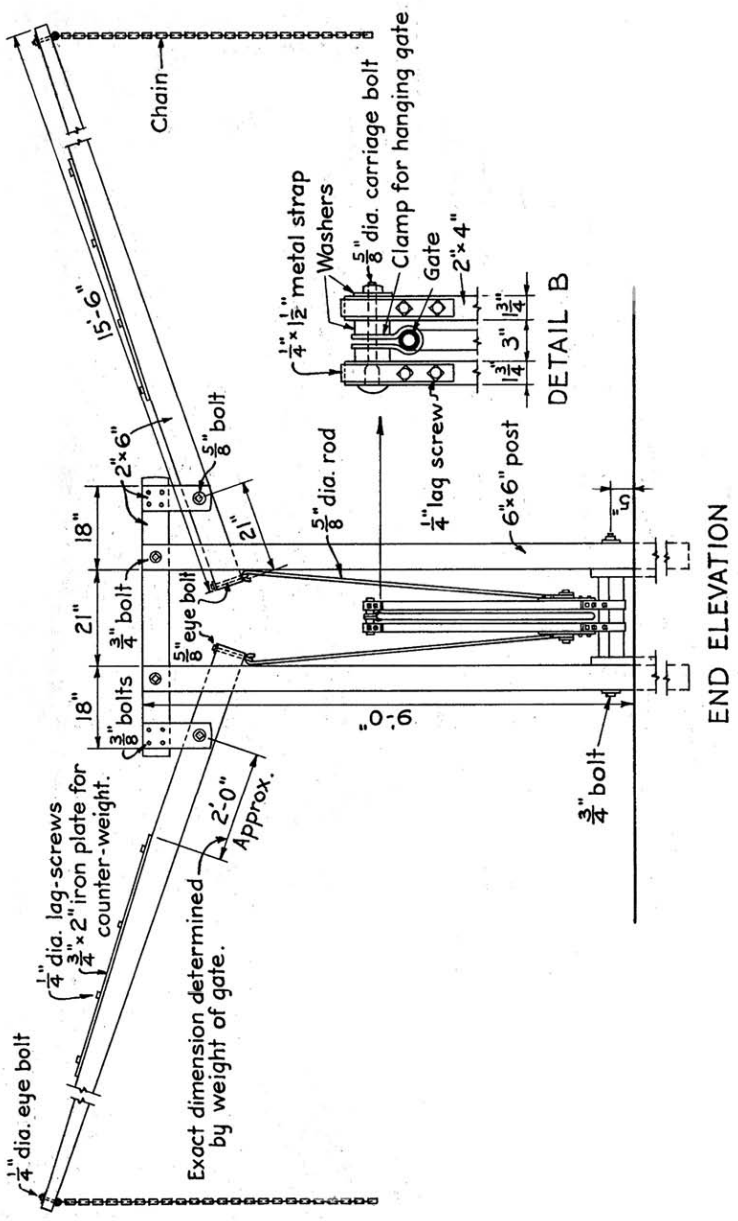
Automatic Gate

- Side Elevation



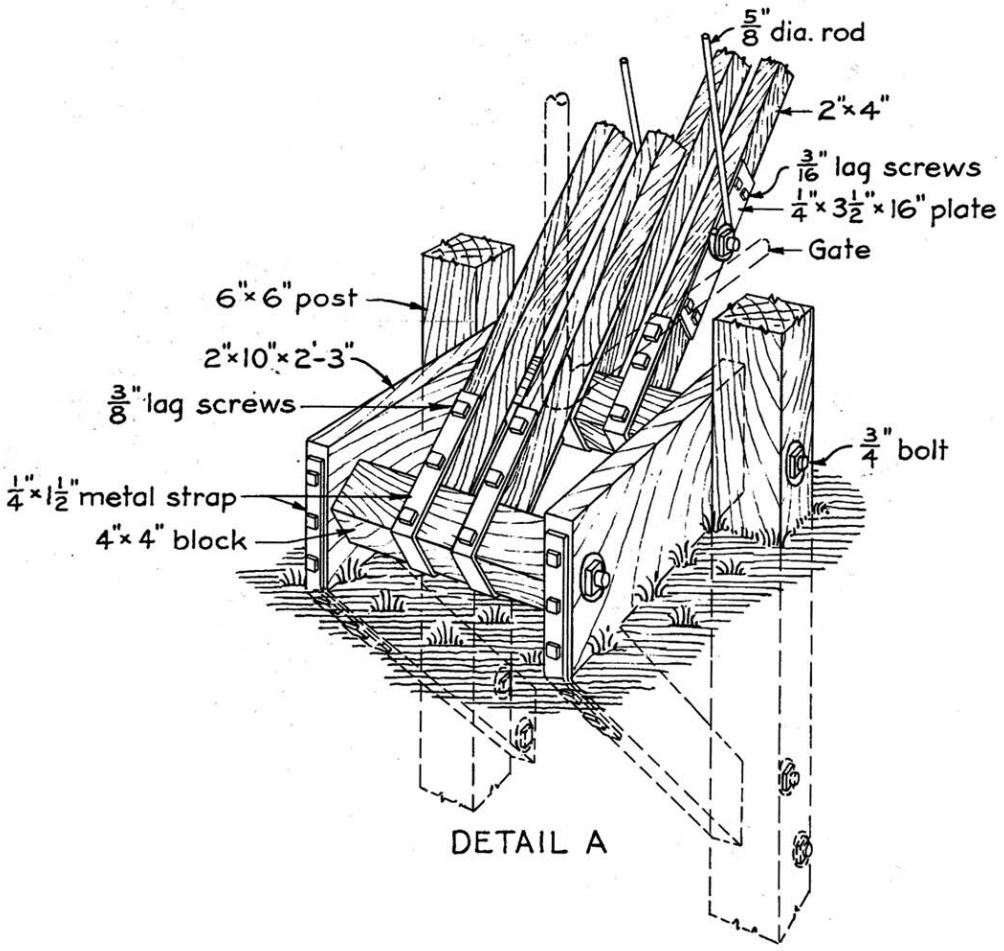
AUTOMATIC GATE

- End Elevation



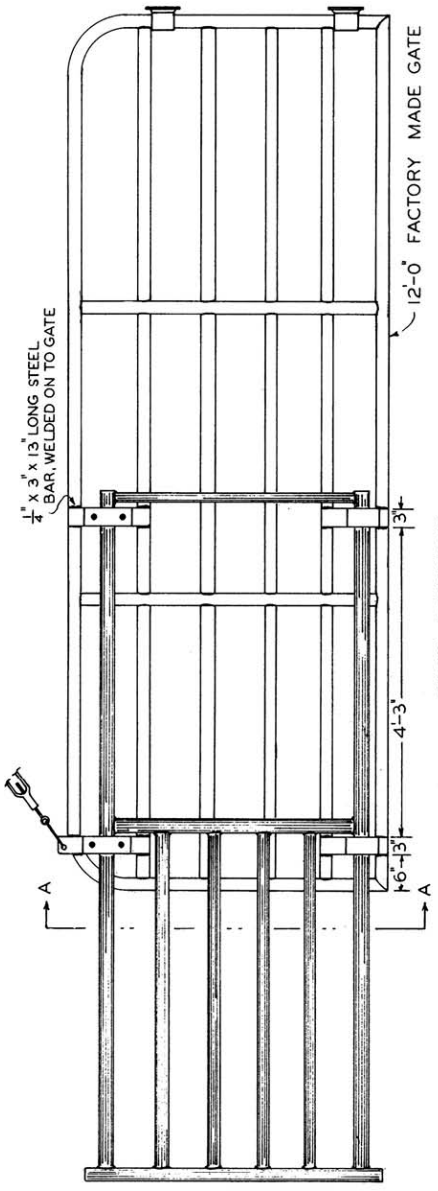
AUTOMATIC GATE

- Detail A

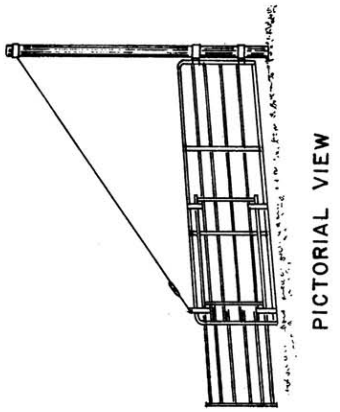


TELESCOPING TYPE GATE

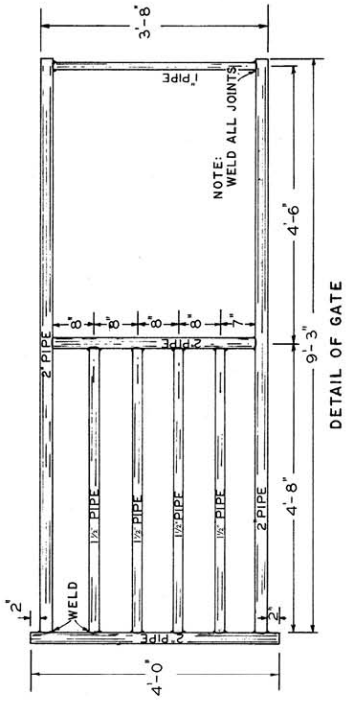
• Gate Assembly • Detail of Gate • Pictorial View



GATE ASSEMBLY



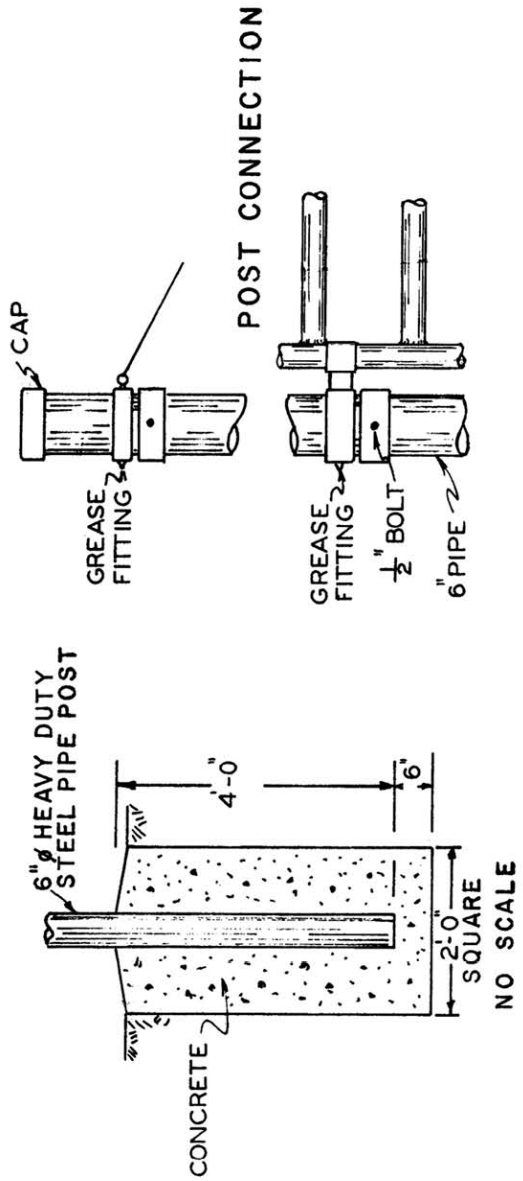
PICTORIAL VIEW



DETAIL OF GATE

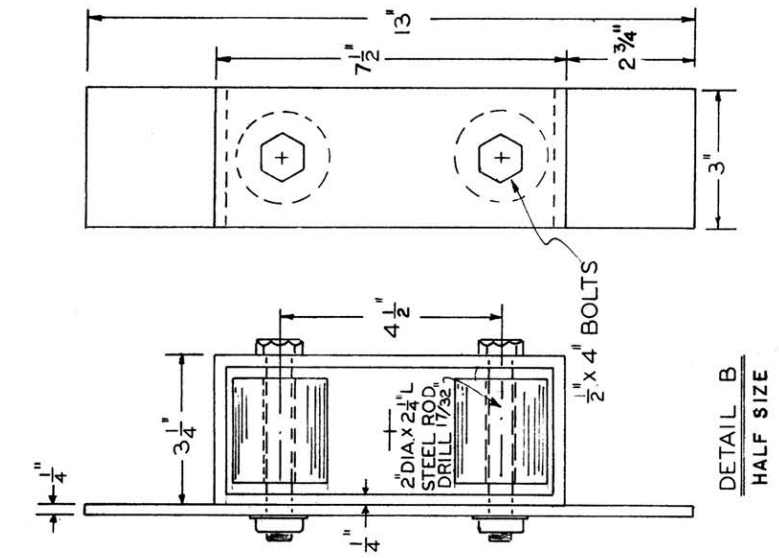
TELESCOPING TYPE GATE

- Post Connection

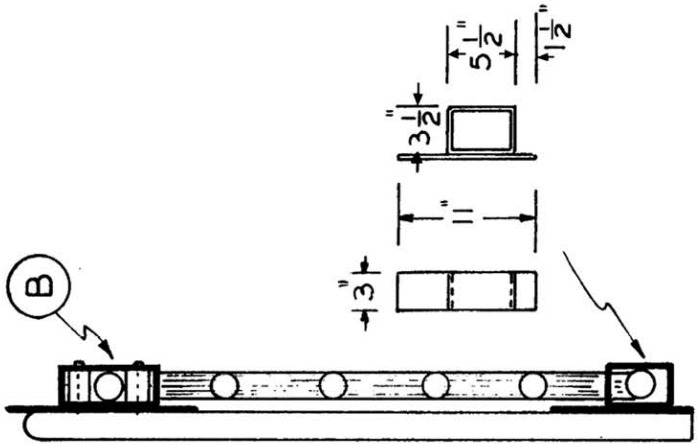


TELESCOPING TYPE GATE

• Section A-A • Detail B



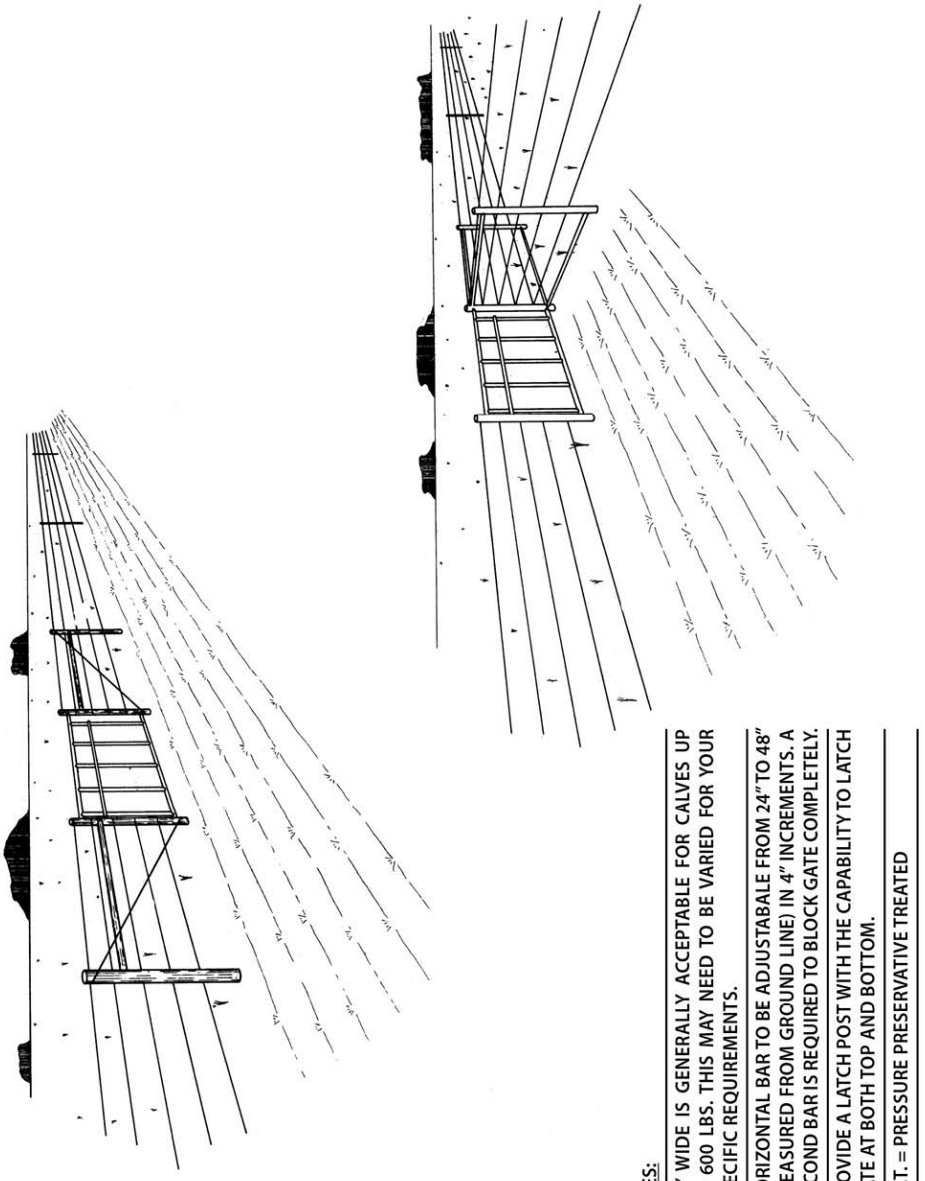
DETAIL B
HALF SIZE



SECTION A-A

Pasture Creep Gate

- Perspective View

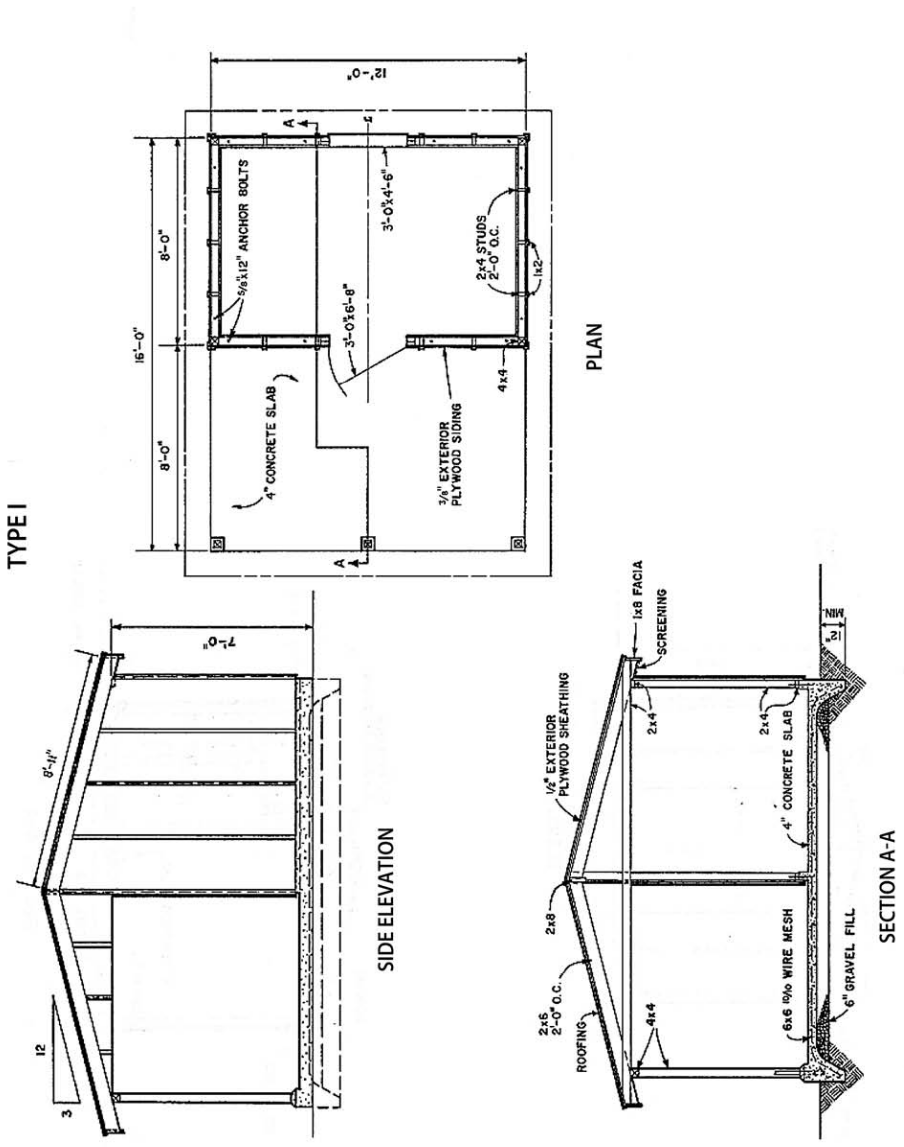


NOTES:

1. 18" WIDE IS GENERALLY ACCEPTABLE FOR CALVES UP TO 600 LBS. THIS MAY NEED TO BE VARIED FOR YOUR SPECIFIC REQUIREMENTS.
2. HORIZONTAL BAR TO BE ADJUSTABALE FROM 24" TO 48" (MEASURED FROM GROUND LINE) IN 4" INCREMENTS. A SECOND BAR IS REQUIRED TO BLOCK GATE COMPLETELY.
3. PROVIDE A LATCH POST WITH THE CAPABILITY TO LATCH GATE AT BOTH TOP AND BOTTOM.
4. P.P.T. = PRESSURE PRESERVATIVE TREATED

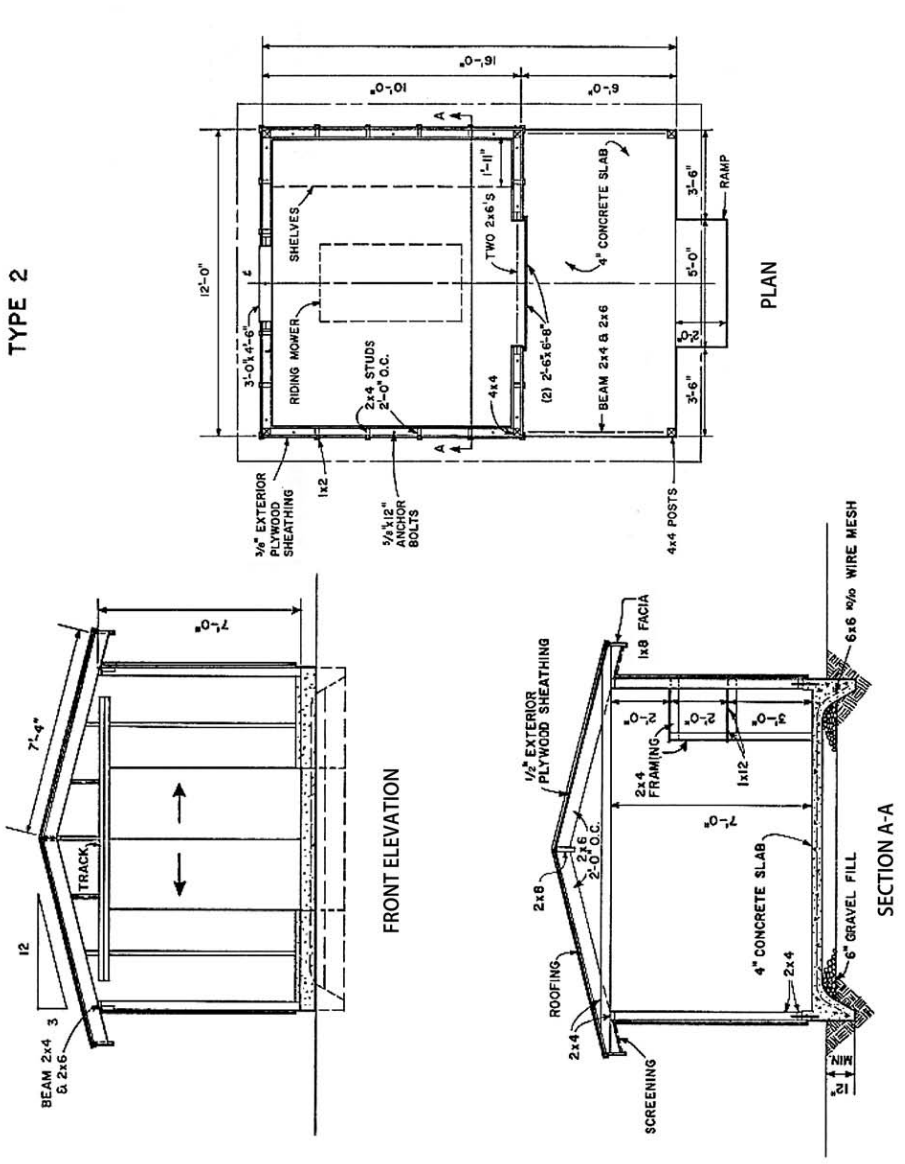
Pasture Creep Gate Type I

- Metal & Wood Construction Stretch Post Assembly



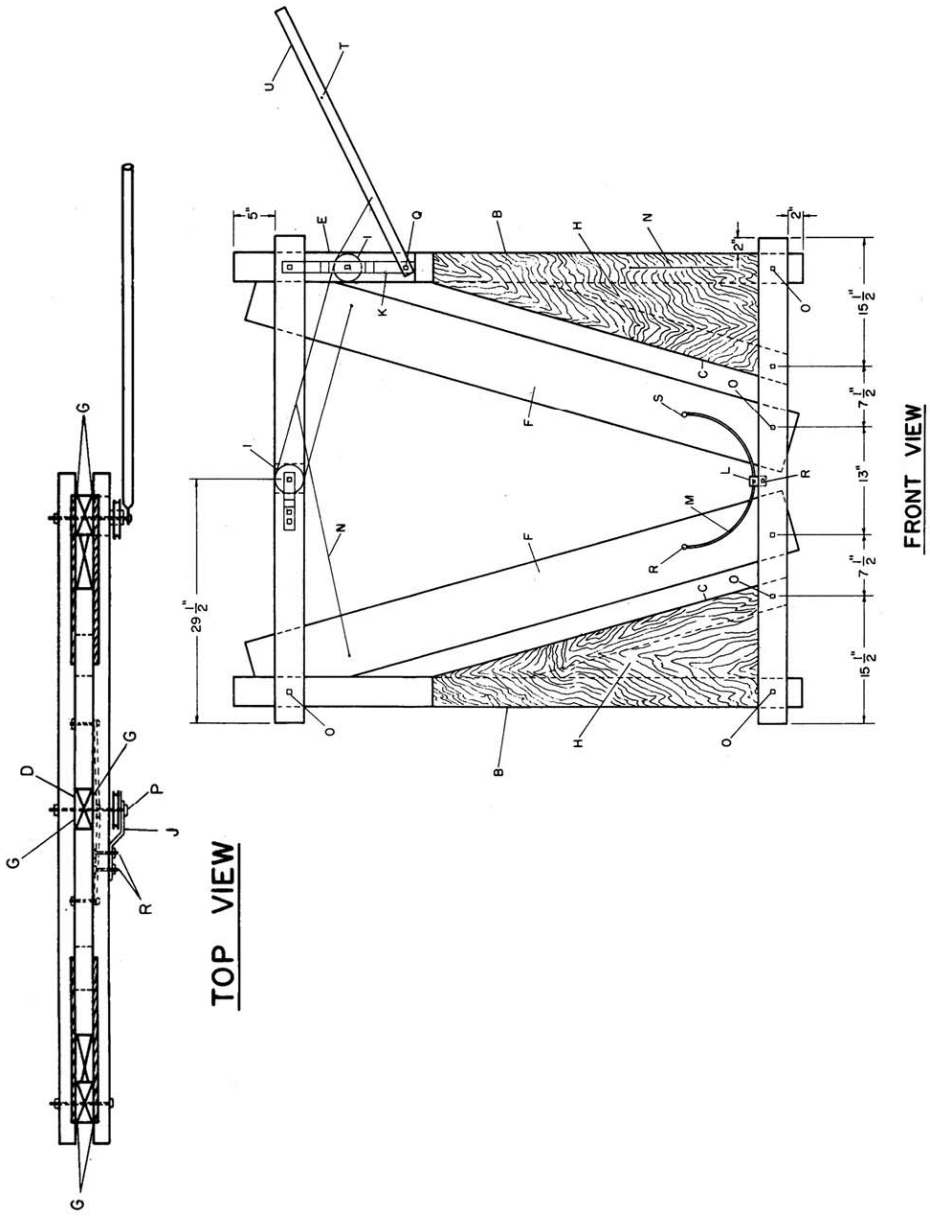
Pasture Creep Gate Type II

- Wood Construction Stretch Post Assembly



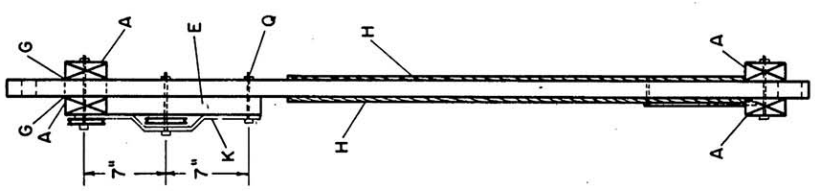
WALK-THROUGH HEAD GATE

• Top View • Front View



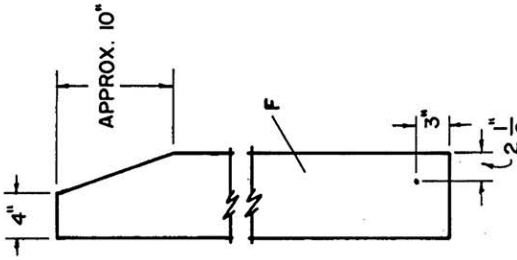
WALK-THROUGH HEAD GATE

• Material List • Neck Board Detail • Side View



SIDE VIEW

HANDLE NOT SHOWN



NECK BOARD DETAIL

NOTES:

1. WELD CUT WASHER (S) TO SPRING TOOTH (M).
2. 3/16" CABLE MAY BE SUBSTITUTED FOR CHAIN (N).
3. USE PRESSURE TREATED LUMBER FOR LONGER LASTING HEADGATE.
4. HEADGATE MAY BE MOUNTED ON CHUTE IF DESIRED.
5. LENGTH OF BOLTS BASED ON KILN DRIED LUMBER.

MATERIAL LIST

ITEM	NO.	DESCRIPTION
A	4	2"X4"X59" HORIZONTALS
B	2	2"X4"X69" UPRIGHTS
C	2	2"X4"X45" BRACE
D	1	2"X4"X4" BLOCK
E	1	2"X4"X13" BLOCK
F	2	2"X8"X67" NECK BOARD
G	14	1" X 4"X4" HARDBOARD SPACER
H	4	1/2" X15"X 39" EXT. PLYWOOD BRACE
I	2	3" PULLEYS
J	1	3/16" X 8" STRAP IRON
K	1	3/16" X 17" STRAP IRON
L	1	1/8" X 4" STRAP IRON
M	1	32" SPRING TOOTH
N	1	3/16" X 124" CHAIN
O	8	1/4" X 5" MACHINE BOLT
P	1	1/4" X 6" MACHINE BOLT
Q	1	1/4" X 3 1/2" MACHINE BOLT
R	5	1/2" X 2" MACHINE BOLT
S	2	1 1/2" CUT WASHER
T	1	HOOK
U	1	1 1/2" X 36" PIPE

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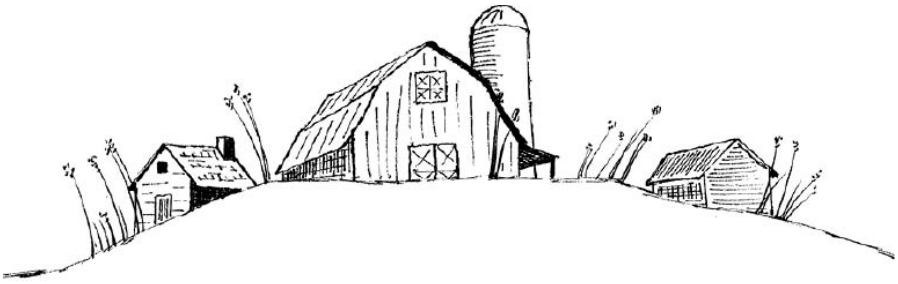


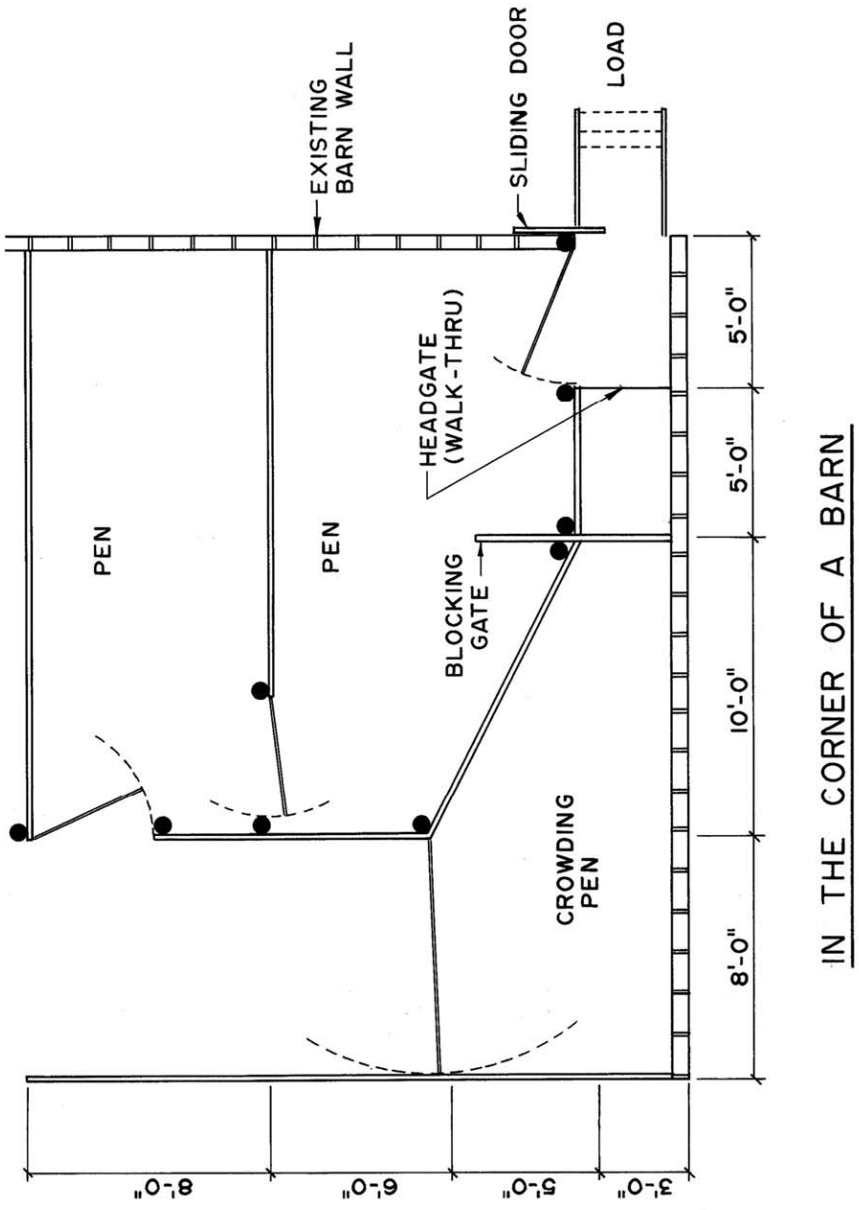
Chapter 9: Corrals & Chutes

Plans Include:

- Simple Corral for the Corner of a Barn
- 50 Head Beef/Cattle Corral
- Basic Working Chute for Cattle
- Moveable Chute for Loading Cattle
- Circular Crowding Pen for Swine

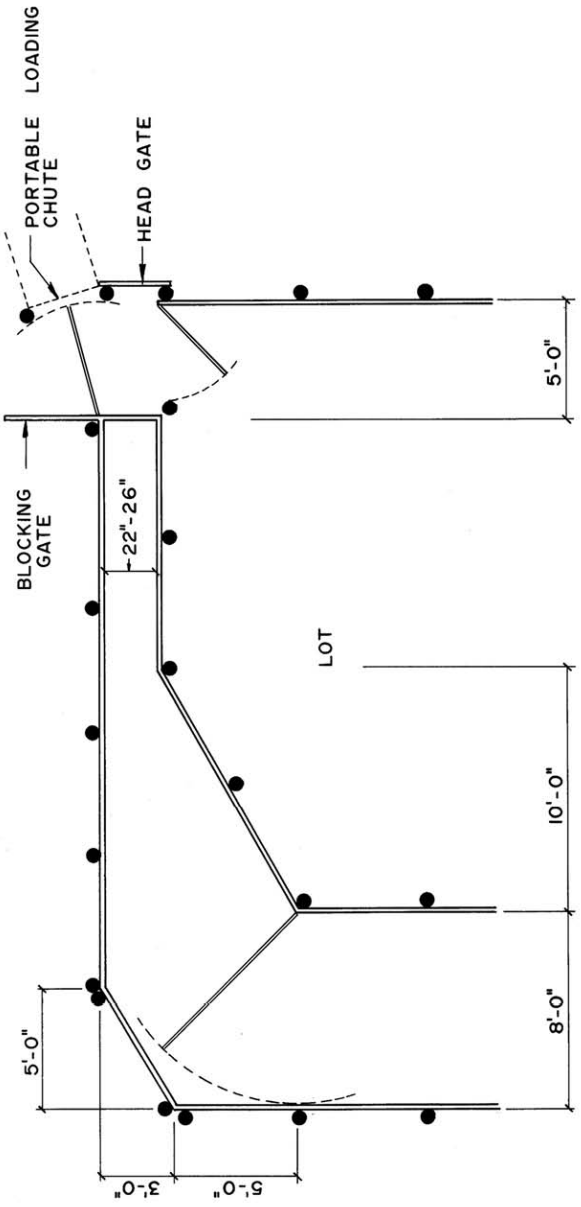
Simple Corral for the Corner of a Barn

- Plan View



Simple Corral for the Corner of a Field

- Plan View



IN THE CORNER OF A FIELD

CONSTRUCTION NOTES & SPECIFICATIONS

HOLDING PENS:
- 20 SQ. FT. PER MATURE ANIMAL
- TWO (OR MORE) PENS
- WATER (IF CATTLE ARE HELD OVERNIGHT)

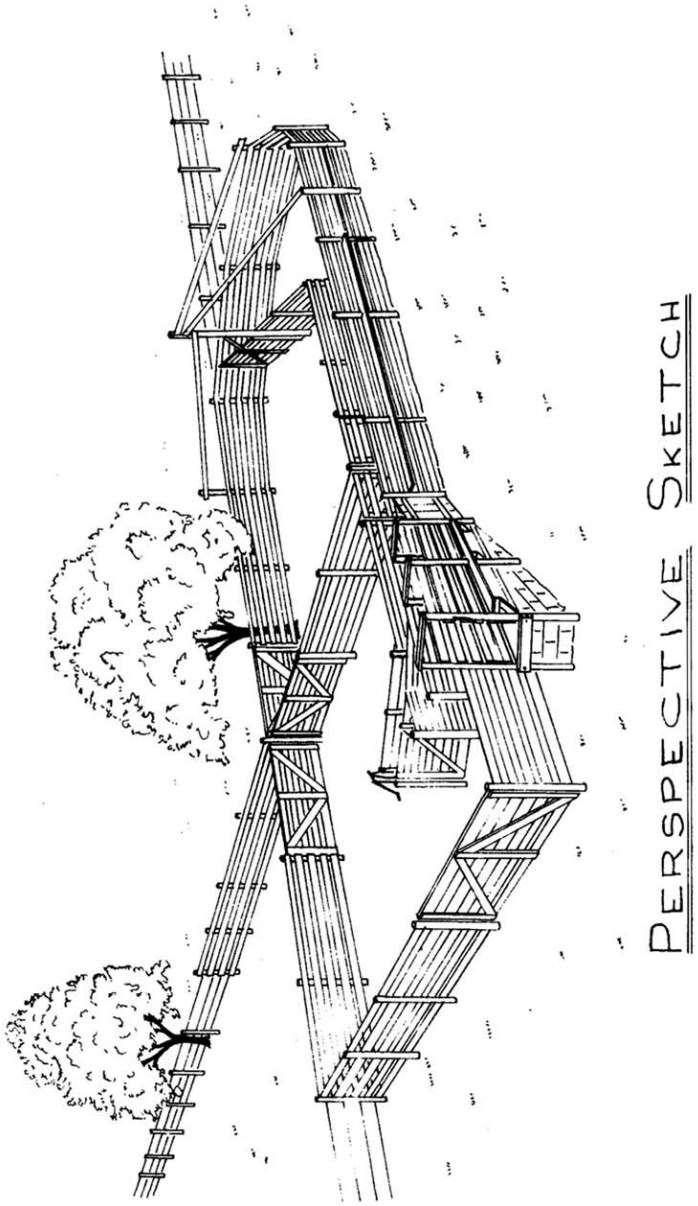
CROWDING PEN:
- 150 SQ. FT. (ONE TRUCKLOAD)

WORKING CHUTE:
- 18 TO 30 FT. LONG
- 22" TO 26" WIDE
- BLOCKING GATES TO SPEED HANDLING & PREVENT CROWDING AT HEADGATE OR SCALES

ADDITIONAL FEATURES:
- PORTABLE SCALES
- SPRAY PEN
- CUTTING GATES FOR SORTING
- SQUEEZE
- WALKING PLATFORM ON ONE OR BOTH SIDES OF THE CHUTE

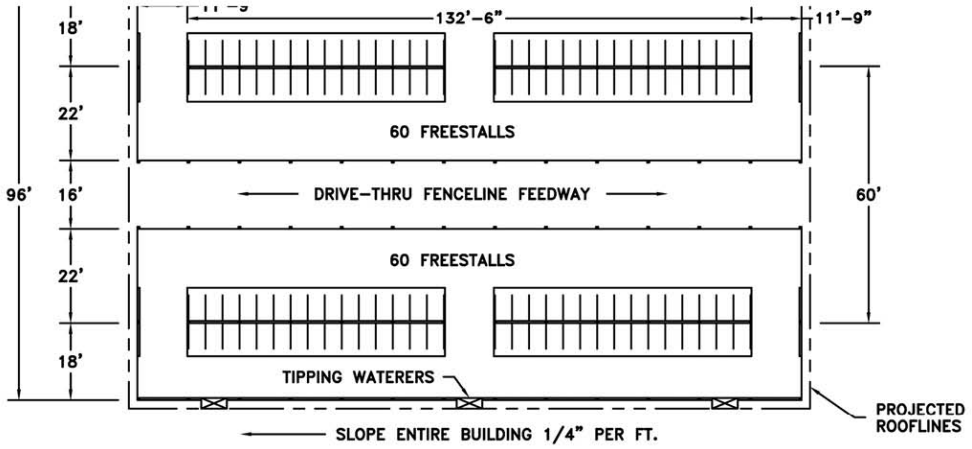
50 Head Beef/Cattle Corral

- Perspective View



50 Head Beef/Cattle Corral

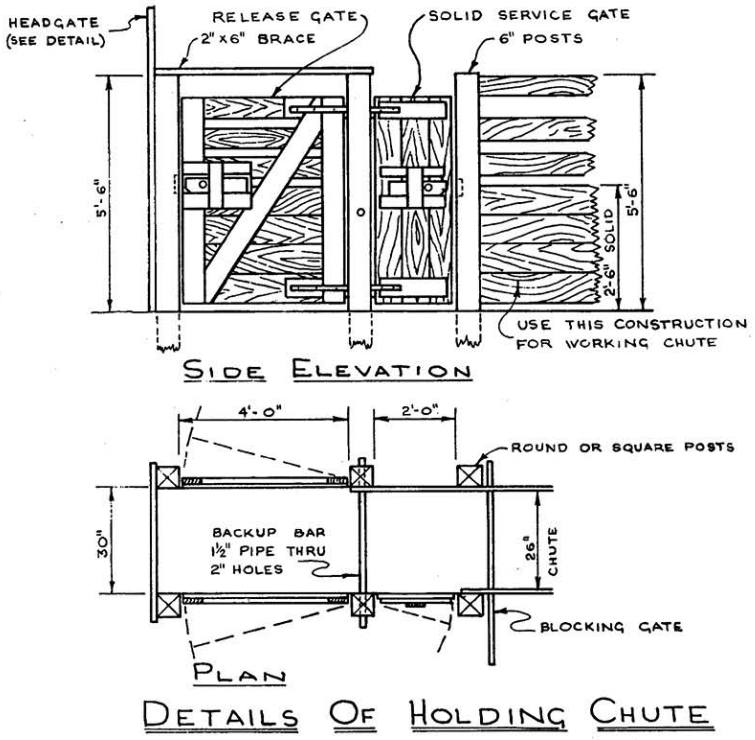
- Plan

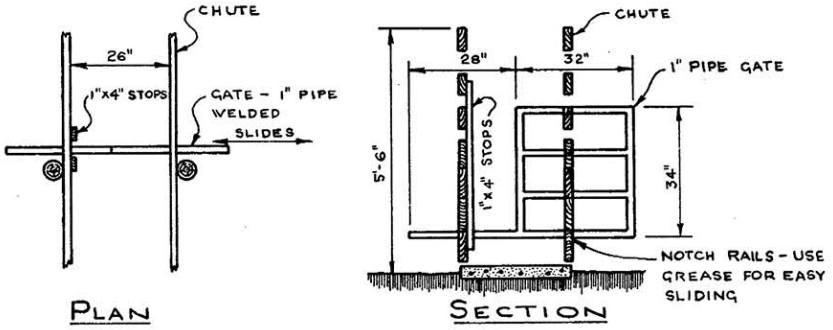


PLAN

50 Head Beef/Cattle Corral

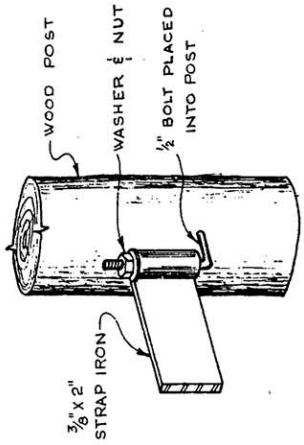
- Details of Blocking Gate



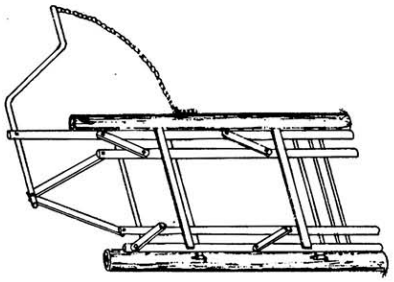


50 Head Beef/Cattle Corral

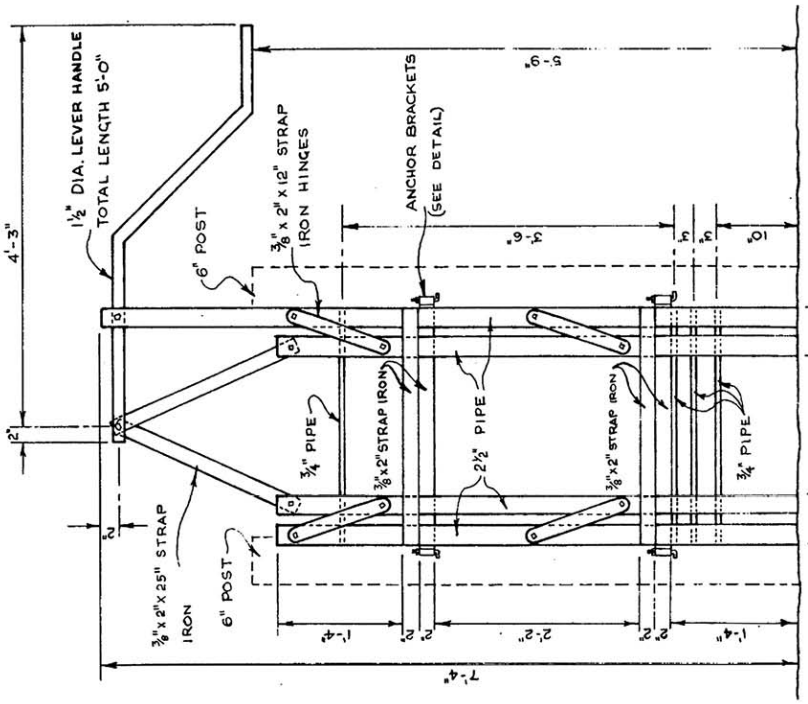
- Headgate Front View • Headgate Anchor Bracket
- Headgate Perspective View



Headgate Anchor Bracket



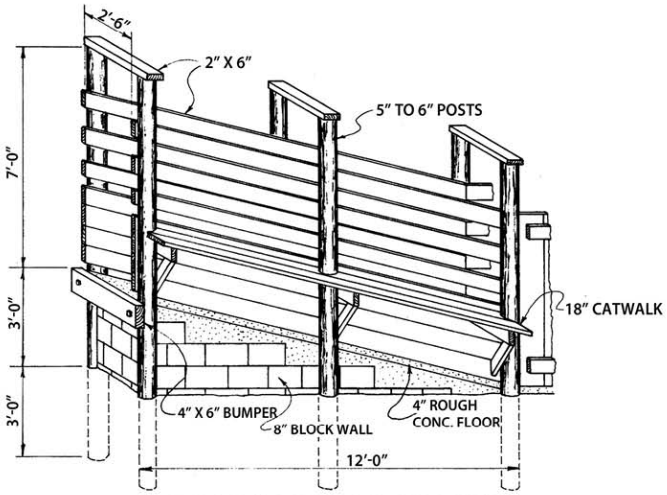
Sketch Of Headgate



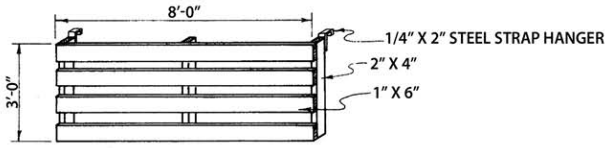
Front View Of Headgate

50 Head Beef/Cattle Corral

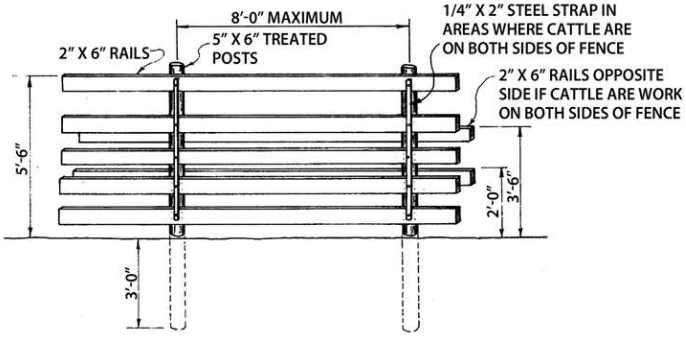
• Loading Ramp Detail • Panels for Chute • Typical Fence



LOADING RAMP DETAIL



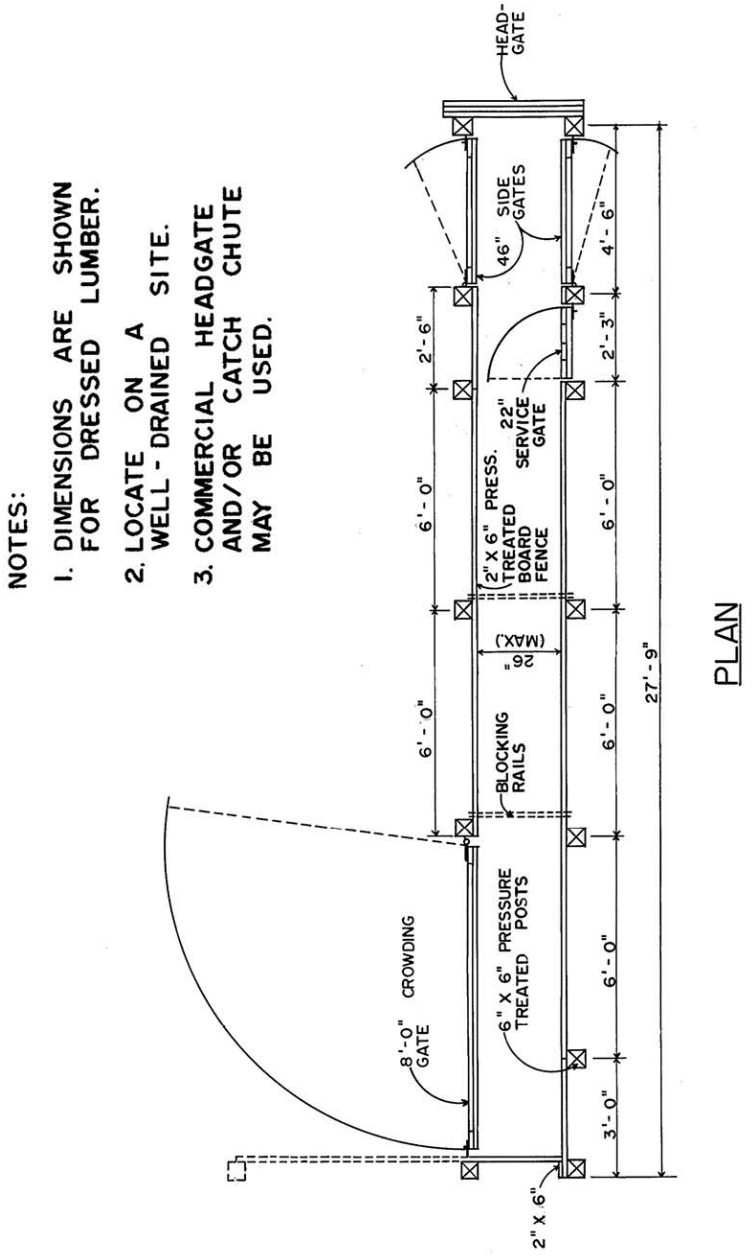
PANELS TO HANG IN CHUTE FOR WORKING SMALL CALVES



TYPICAL FENCE

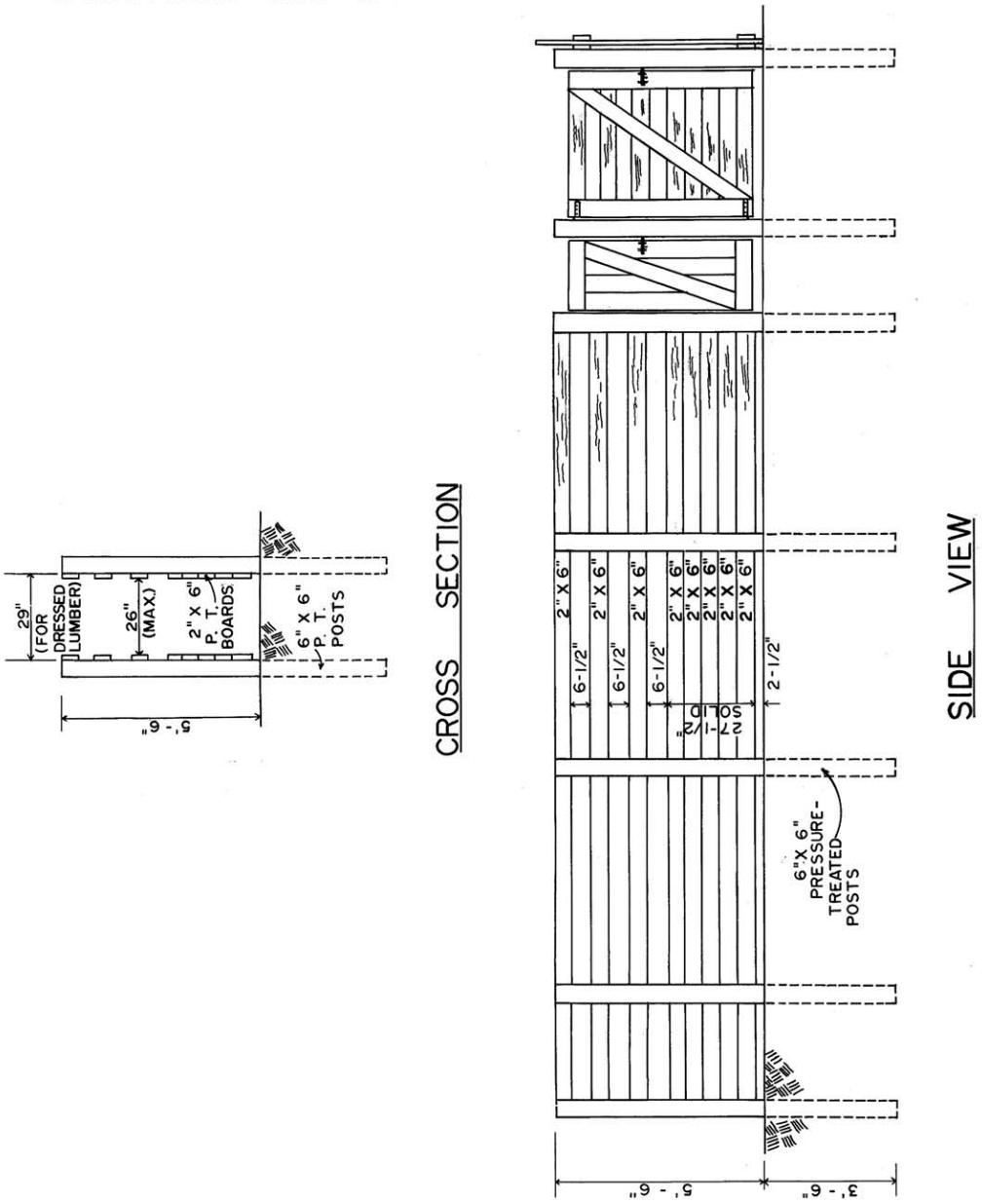
Basic Working Chute for Cattle

• Plan • Notes



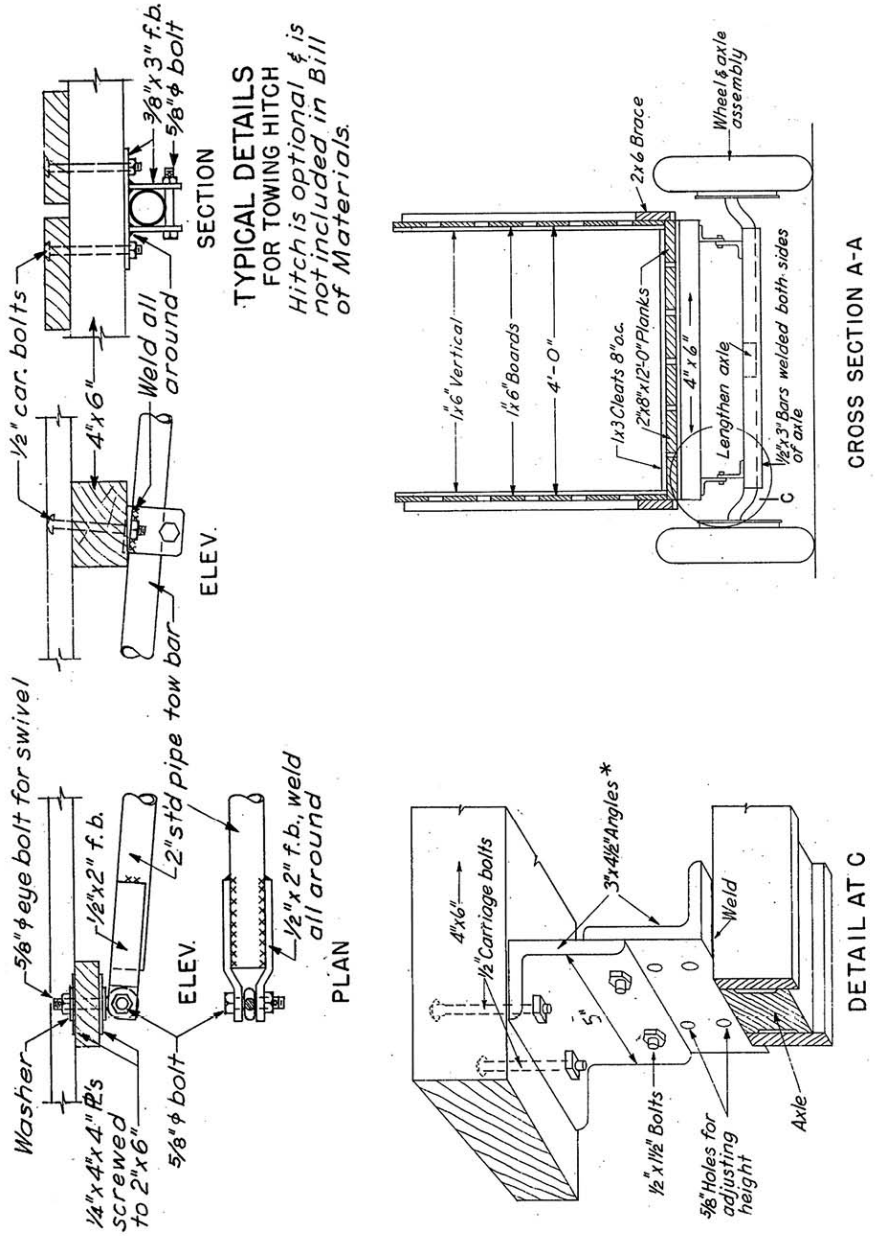
Basic Working Chute for Cattle

• Cross Section • Side View



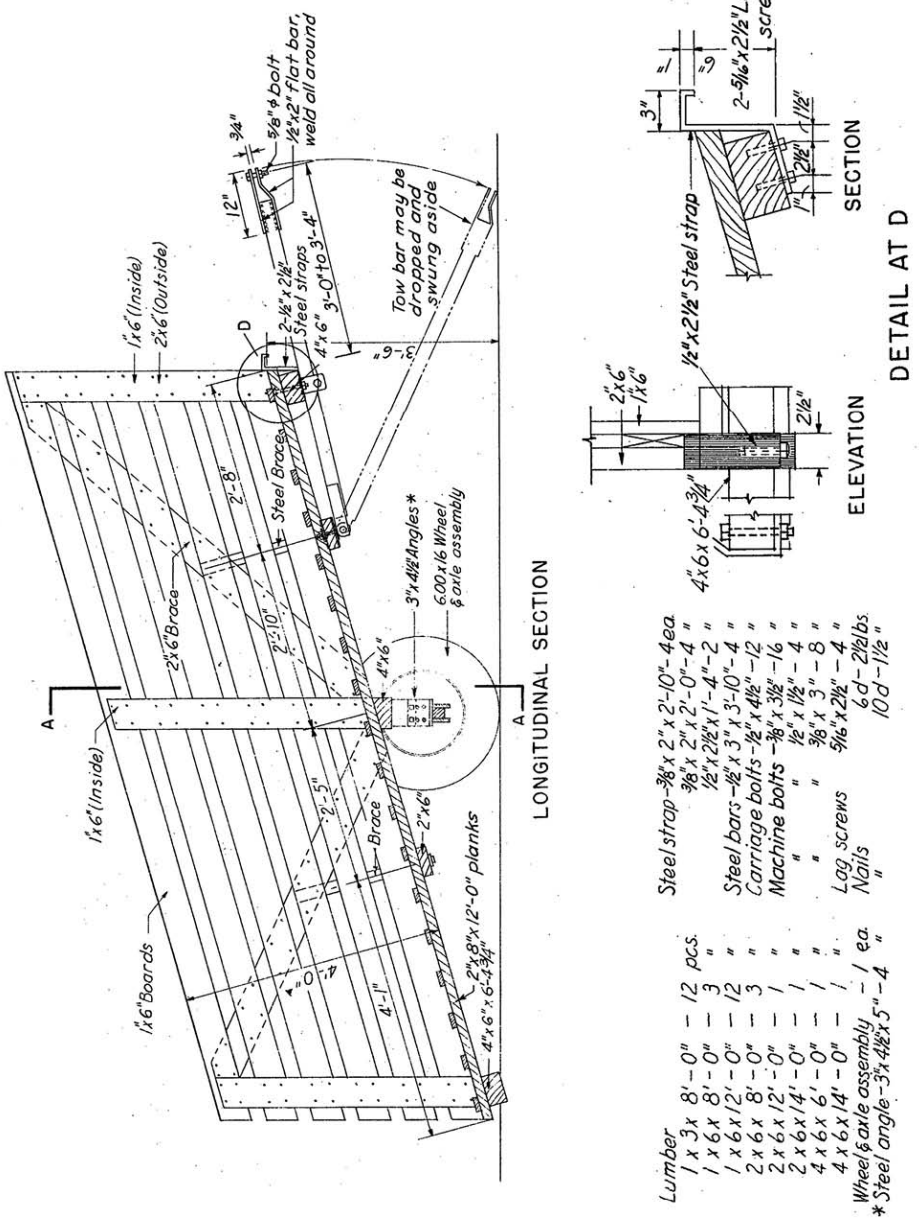
MOVEABLE CHUTE FOR LOADING CATTLE

• Plan • Detail at C • Cross Section A-A



MOVEABLE CHUTE FOR LOADING CATTLE

• Longituinal Section • Detail at D

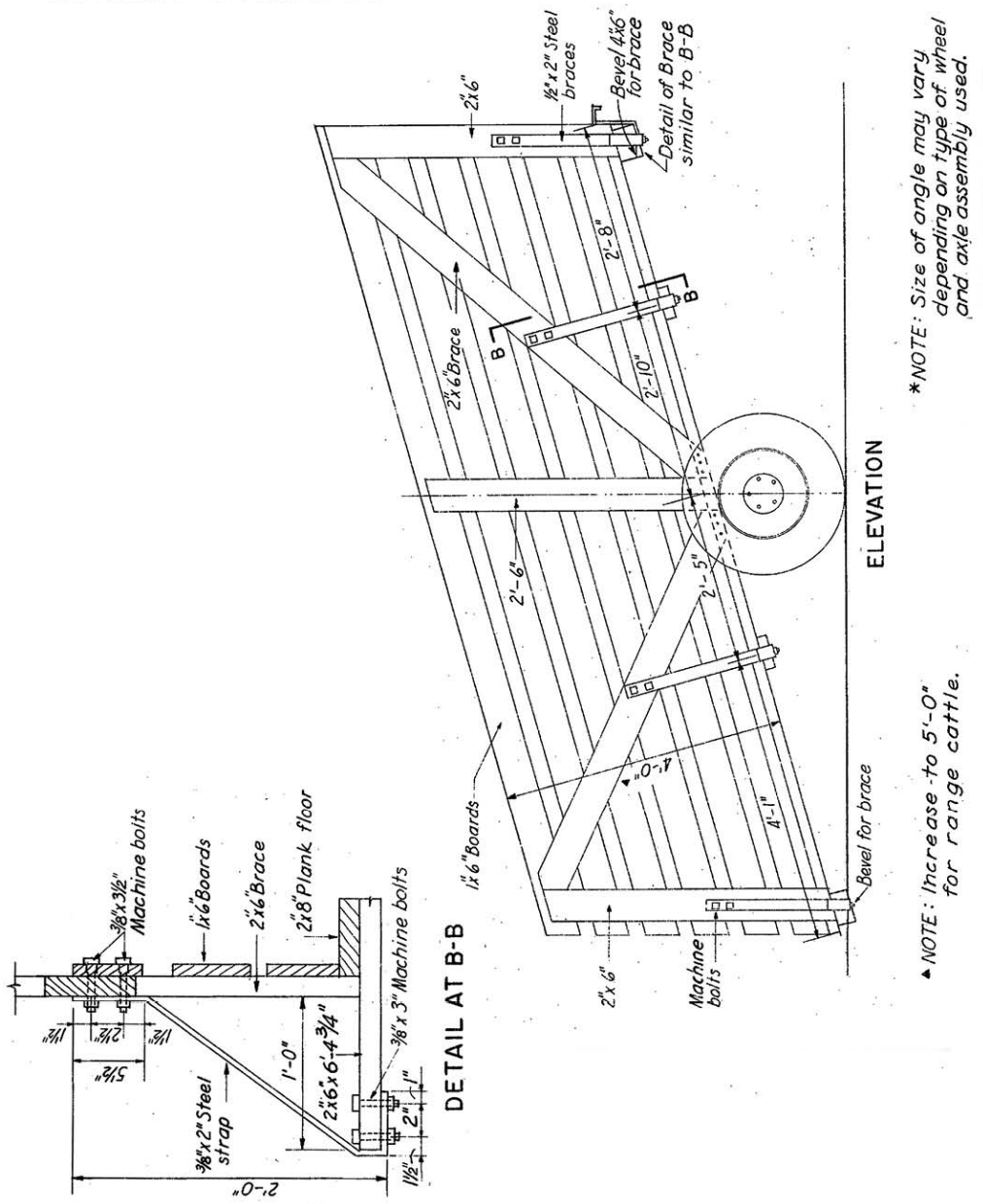


Lumber
1 x 3 x 8'-0" – 12 pcs.
1 x 6 x 8'-0" – 3 "
1 x 6 x 12'-0" – 12 "
2 x 6 x 8'-0" – 3 "
2 x 6 x 12'-0" – 1 "
2 x 6 x 14'-0" – 1 "
4 x 6 x 6'-0" – 1 "
4 x 6 x 14'-0" – 1 "
Wheel & axle assembly – 1 ea.
* Steel angle - 3"x4½"x5'-4 "

Steel strap - ⅜" x 2" x 2'-10" - 4 ea.
⅜" x 2" x 2'-0" - 4 "
½" x 2½" x 1'-4" - 2 "
Steel bars - ½" x 3" x 3'-10" - 4 "
Carriage bolts - ½" x 4½" - 12 "
Machine bolts - ⅜" x 3½" - 16 "
" " ½" x 1½" - 4 "
" " ⅜" x 3" - 8 "
Lag screws 5/16" x 2½" - 4 "
Nails 6d - 2½ lbs.
" 10d - 1½ "

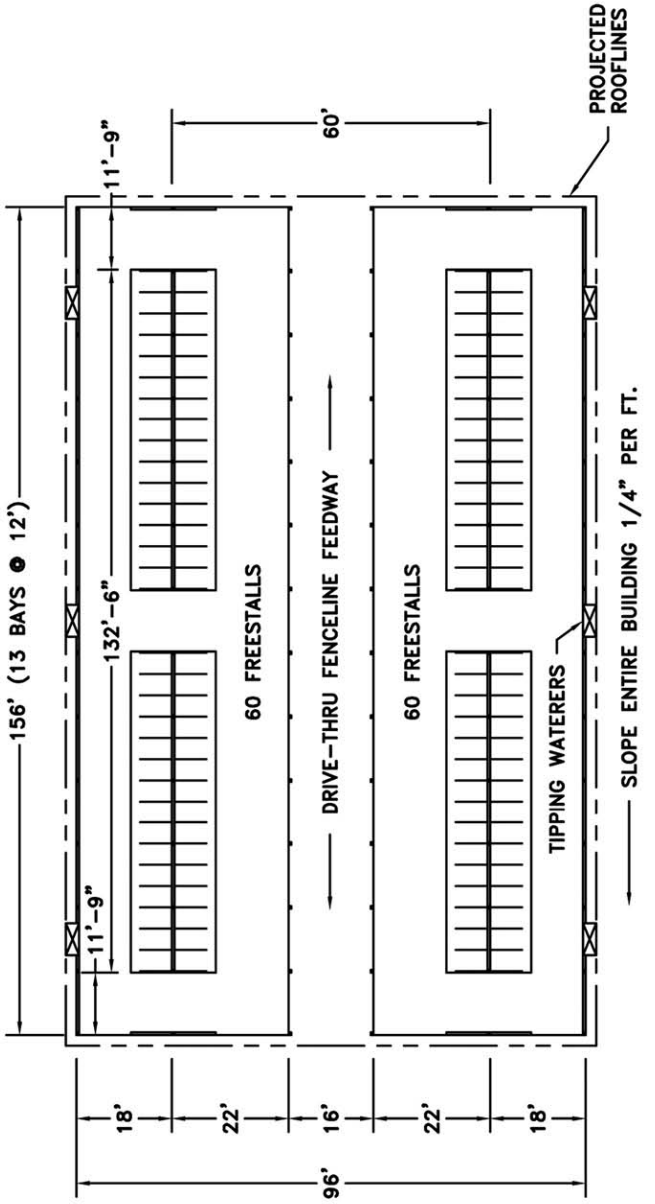
MOVEABLE CHUTE FOR LOADING CATTLE

• Elevation • Detail at B-B



Circular Crowding Pen for Swine

- Plan

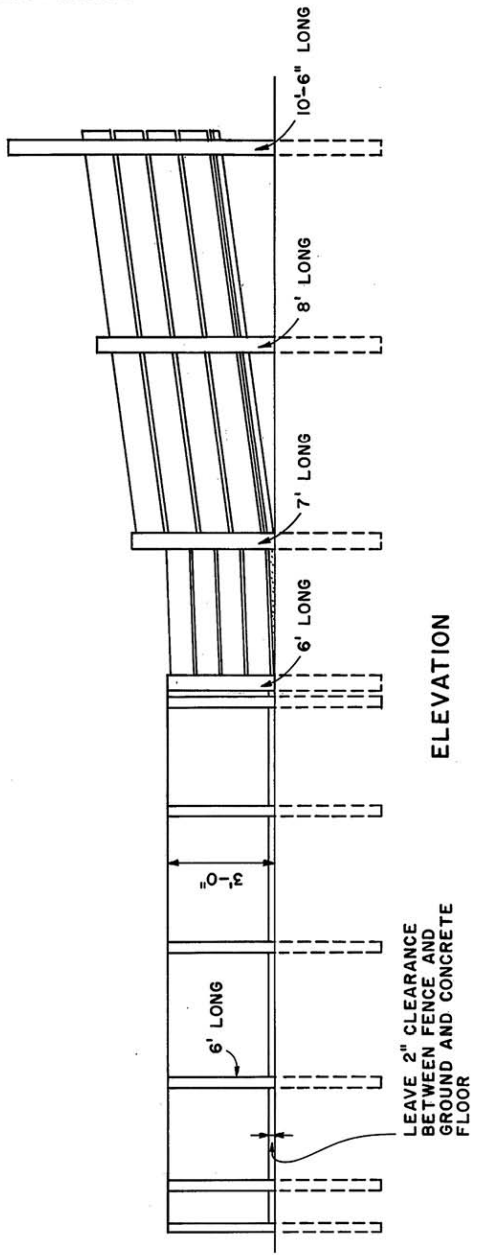


PLAN

Circular Crowding Pen for Swine

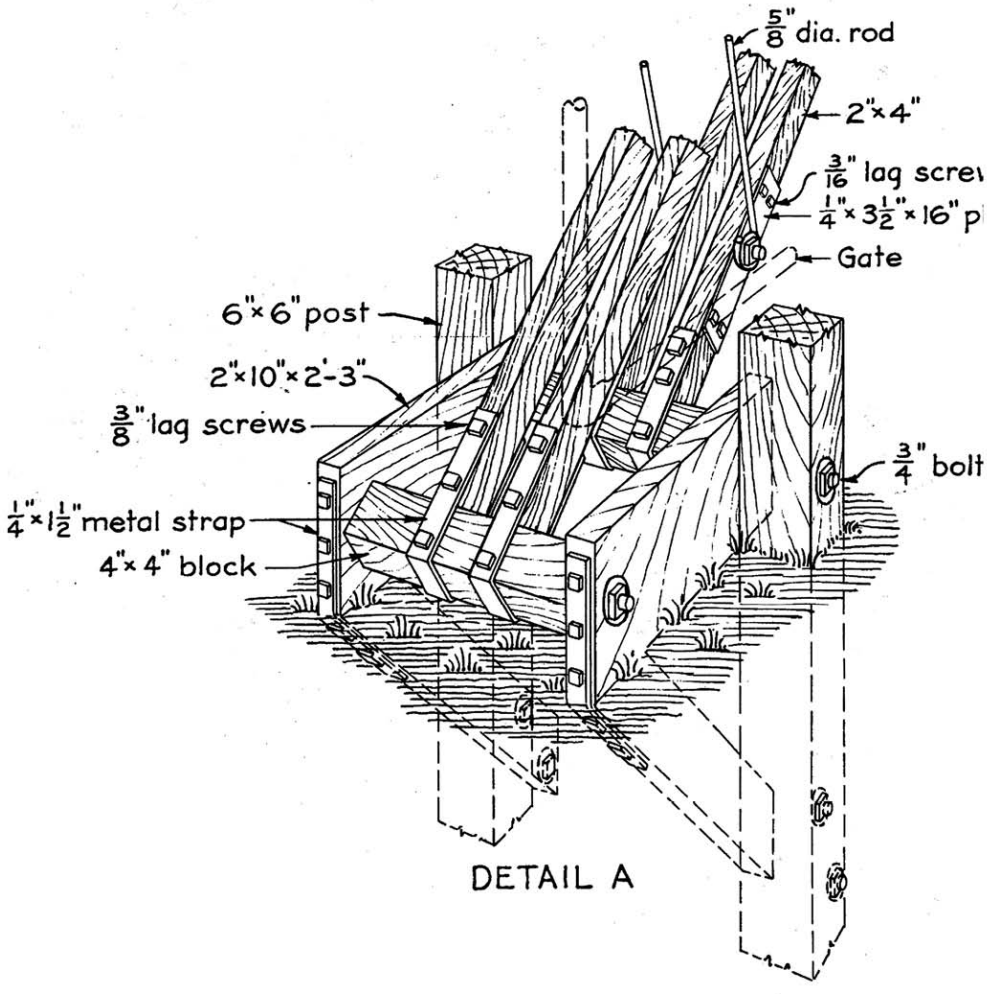
• Capacity of Loading Pens • Elevation

CAPACITY OF LOADING PENS		
DIAMETER (FT.)	FEEDER PIGS AT 2 SQ. FT.	MARKET HOGS AT 6 SQ. FT.
12	57	19
16	100	34
20	157	52
24	226	75
28	308	103
32	402	134



Circular Crowding Pen for Swine

- Detail A



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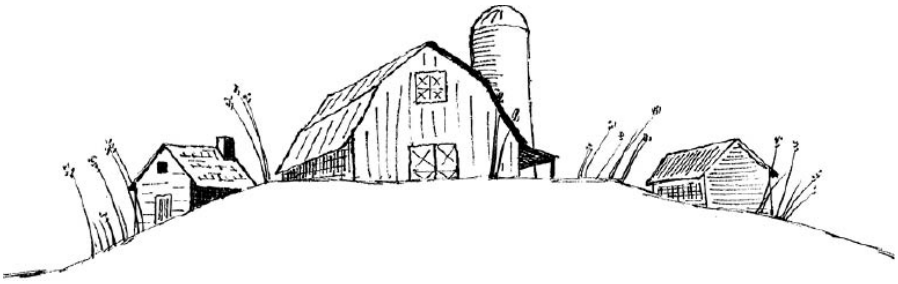
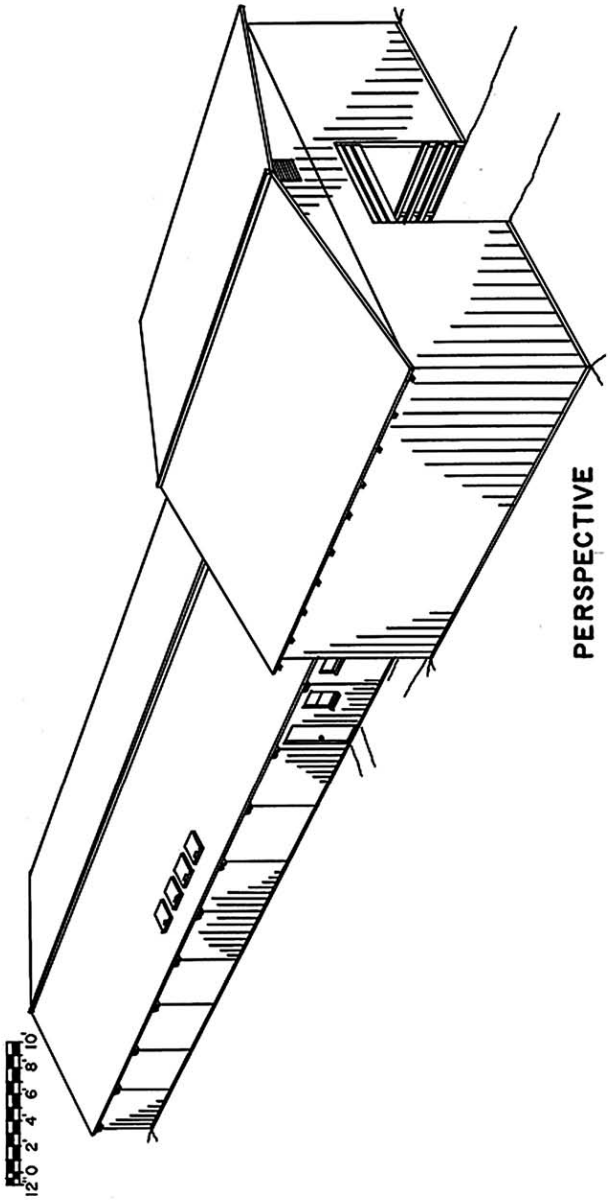


Chapter 10: Cattle & Auction Barn

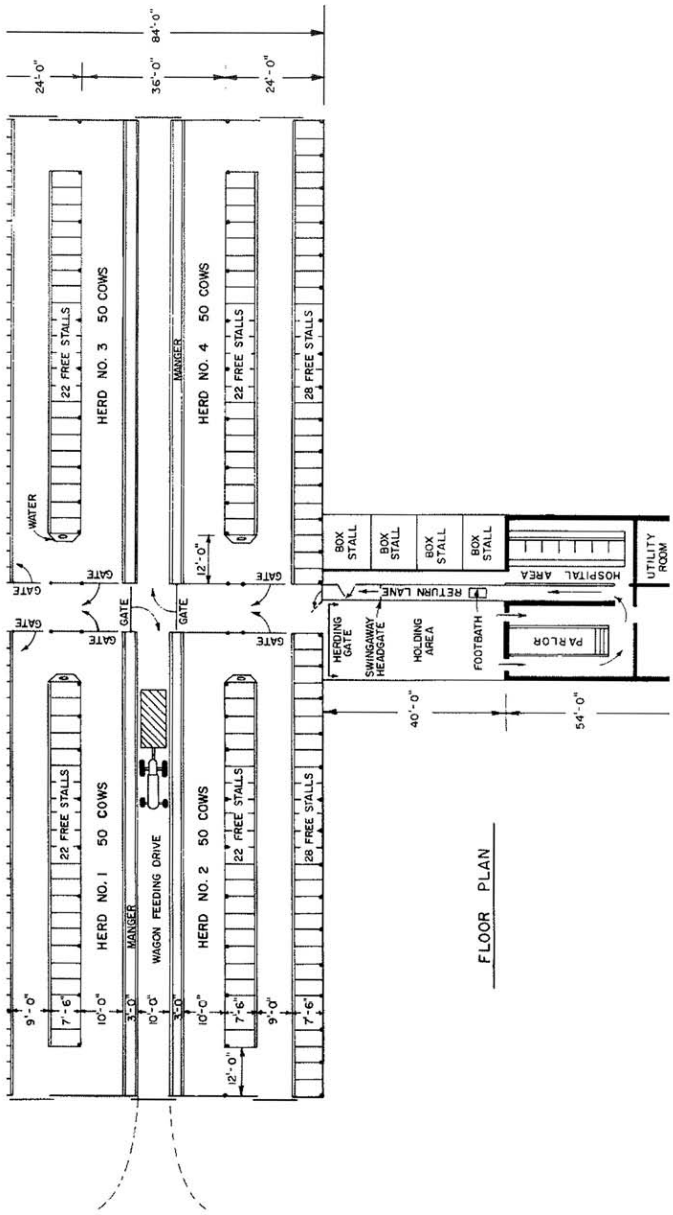
Cattle & Auction Barn

- Perspective View



CATTLE & AUCTION BARN

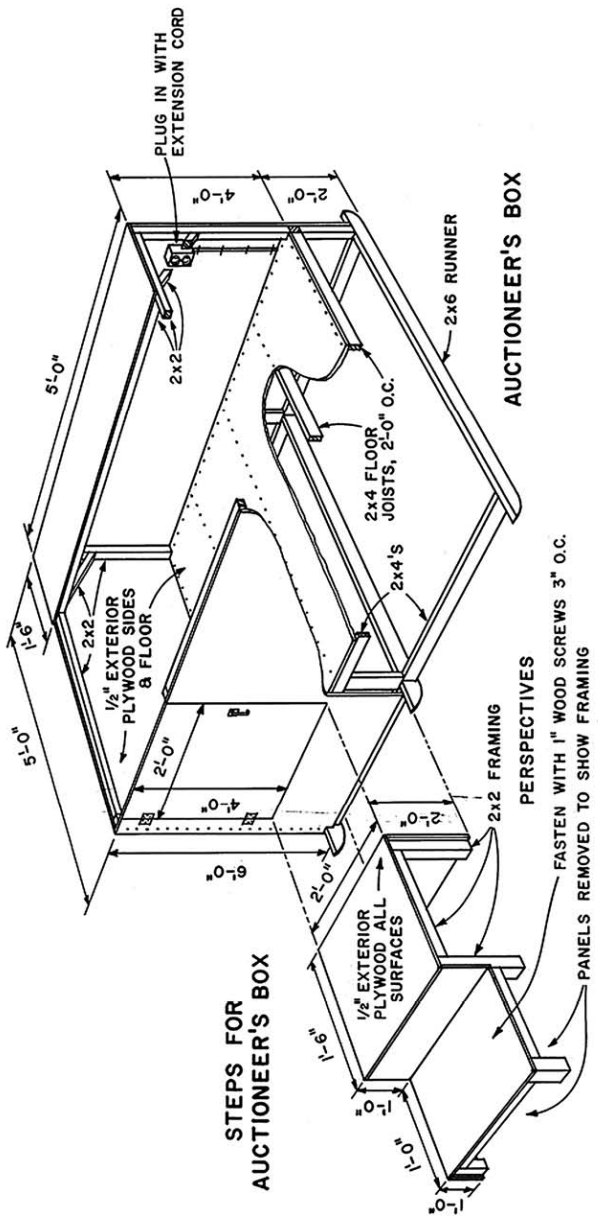
- Floor Plan



FLOOR PLAN

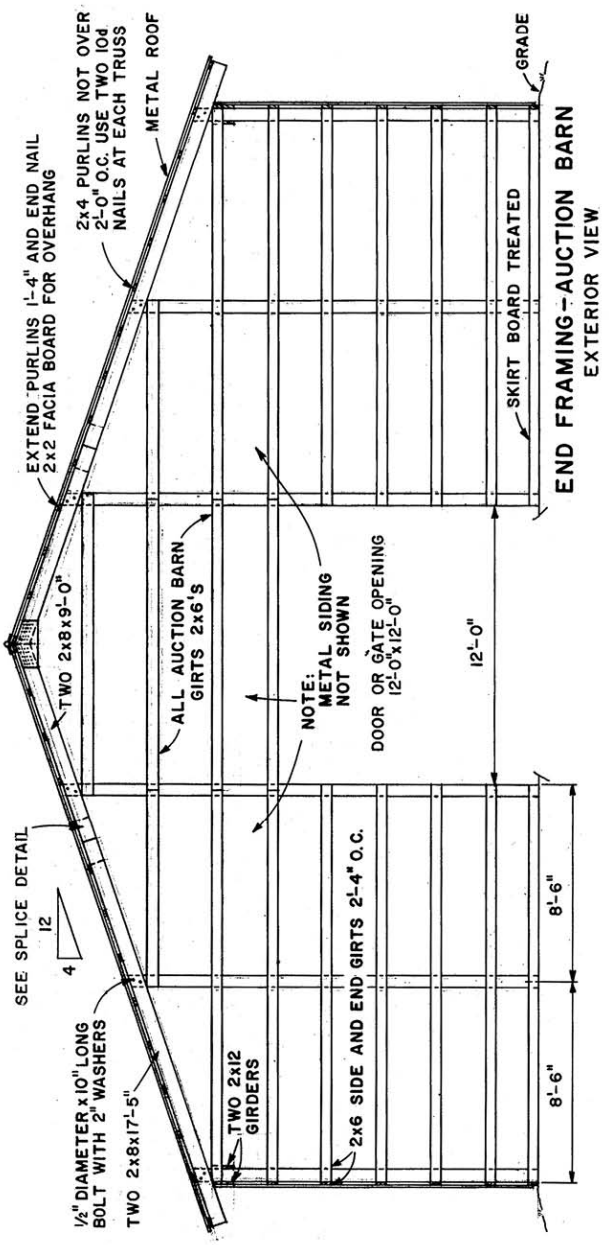
Cattle & Auction Barn

- Auctioneer's Box



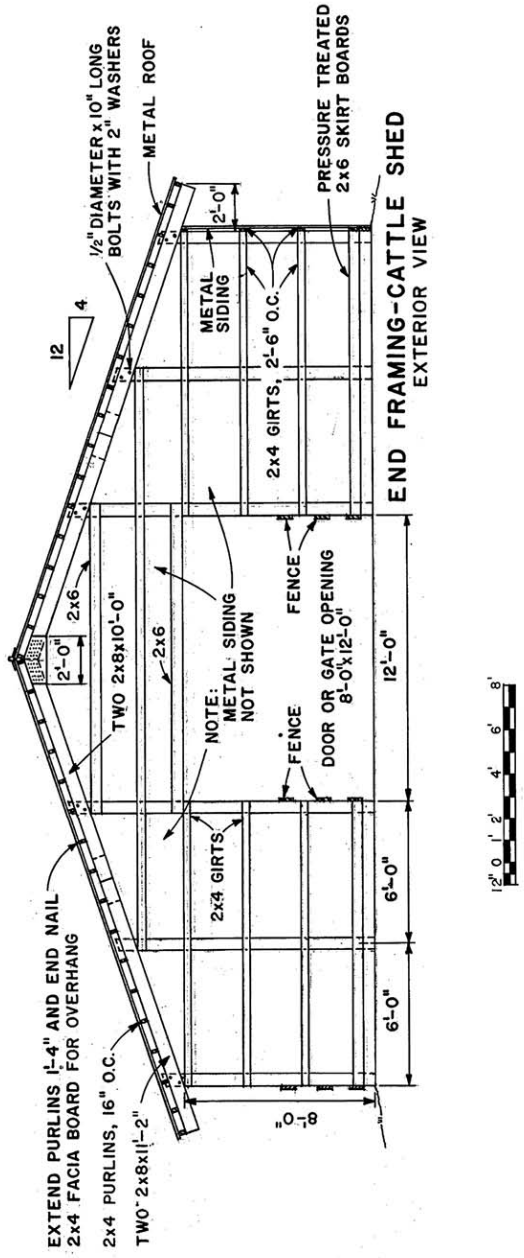
Cattle & Auction Barn

- End Framing of Auction Barn



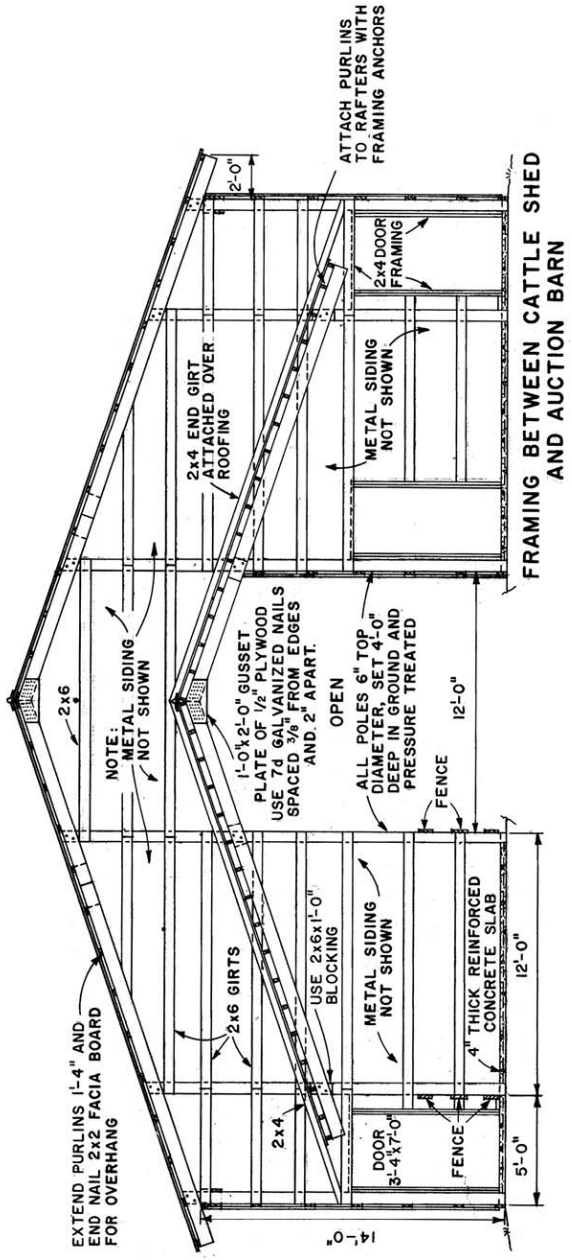
Cattle & Auction Barn

- End Framing of Cattle Shed

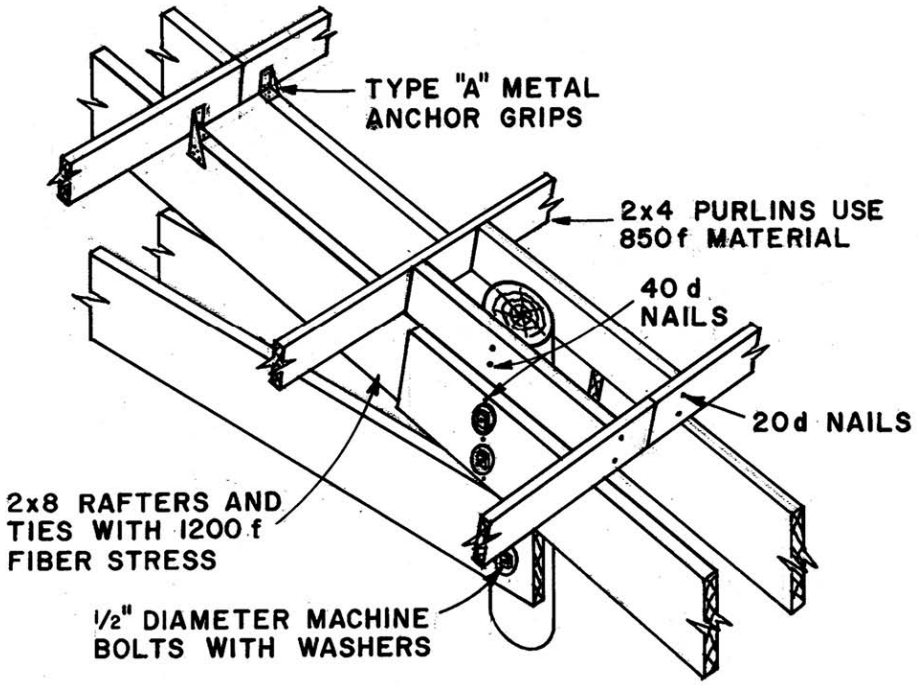


CATTLE & AUCTION BARN

- Framing Between Cattle Shed & Auction Barn


FRAMING BETWEEN CATTLE SHED AND AUCTION BARN
ATTACH PURLINS TO RAFTERS WITH FRAMING ANCHORS
2'-0"
2x4 DOOR FRAMING
METAL SIDING NOT SHOWN
2x4 END GIRT ATTACHED OVER ROOFING
1'-0"x2'-0" GUSSET PLATE OF 1/2" PLYWOOD USE 7d GALVANIZED NAILS SPACED 3/8" FROM EDGES AND 2" APART.
OPEN
ALL POLES 6" TOP DIAMETER, SET 4'-0" DEEP IN GROUND AND PRESSURE TREATED
FENCE
12'-0"
2x6
NOTE: METAL SIDING NOT SHOWN
EXTEND PURLINS 1'-4" AND END NAIL 2x2 FACIA BOARD FOR OVERHANG
2x6 GIRTS
USE 2x6x1'-0" BLOCKING
METAL SIDING NOT SHOWN
4" THICK REINFORCED CONCRETE SLAB
12'-0"
2x4
DOOR 3'-4"x7'-0"
FENCE
5'-0"
14'-0"

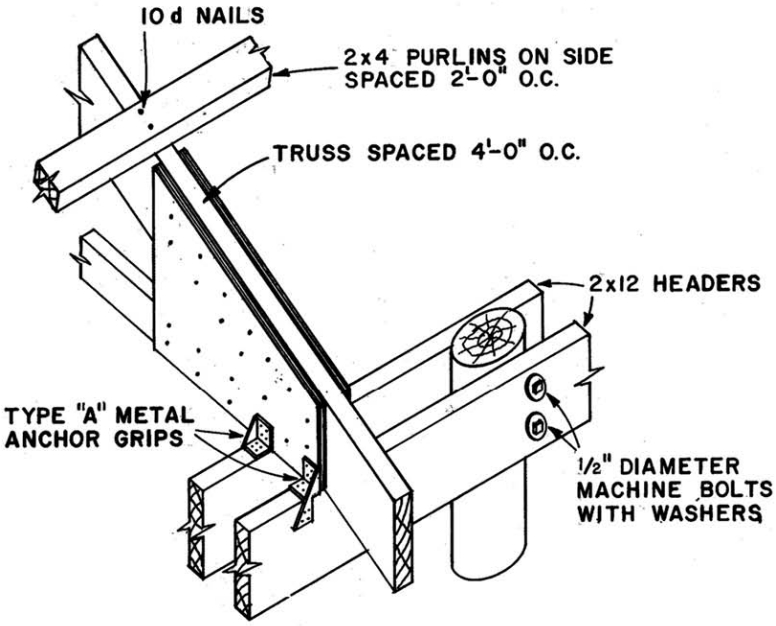
- Perpective View of Purlin Tie at Rafter & Pole



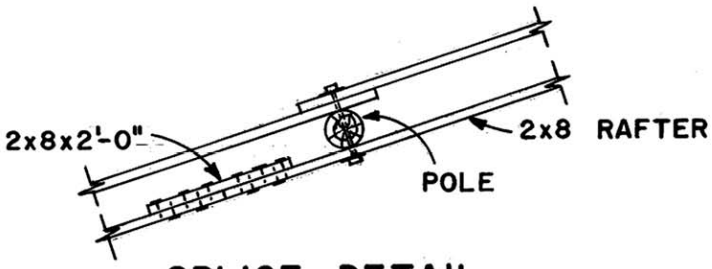
PURLIN TIE AT RAFTER AND POLE
PERSPECTIVE

CATTLE & AUCTION BARN

• Truss Attachment to Header • Splice Detail


10d NAILS
2x4 PURLINS ON SIDE SPACED 2'-0" O.C.
TRUSS SPACED 4'-0" O.C.
2x12 HEADERS
TYPE "A" METAL ANCHOR GRIPS
1/2" DIAMETER MACHINE BOLTS WITH WASHERS

TRUSS ATTACHMENT TO HEADER
ISOMETRIC

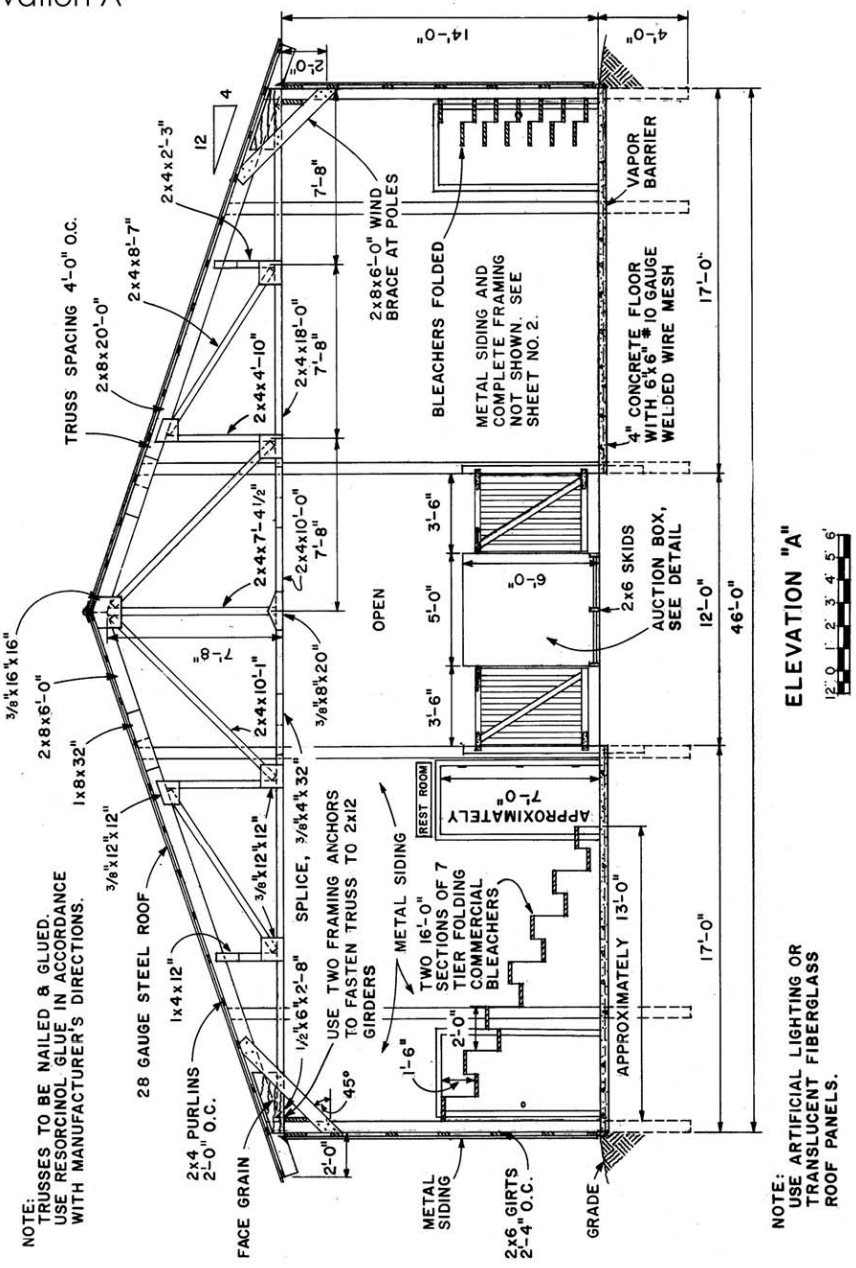


SPLICE DETAIL

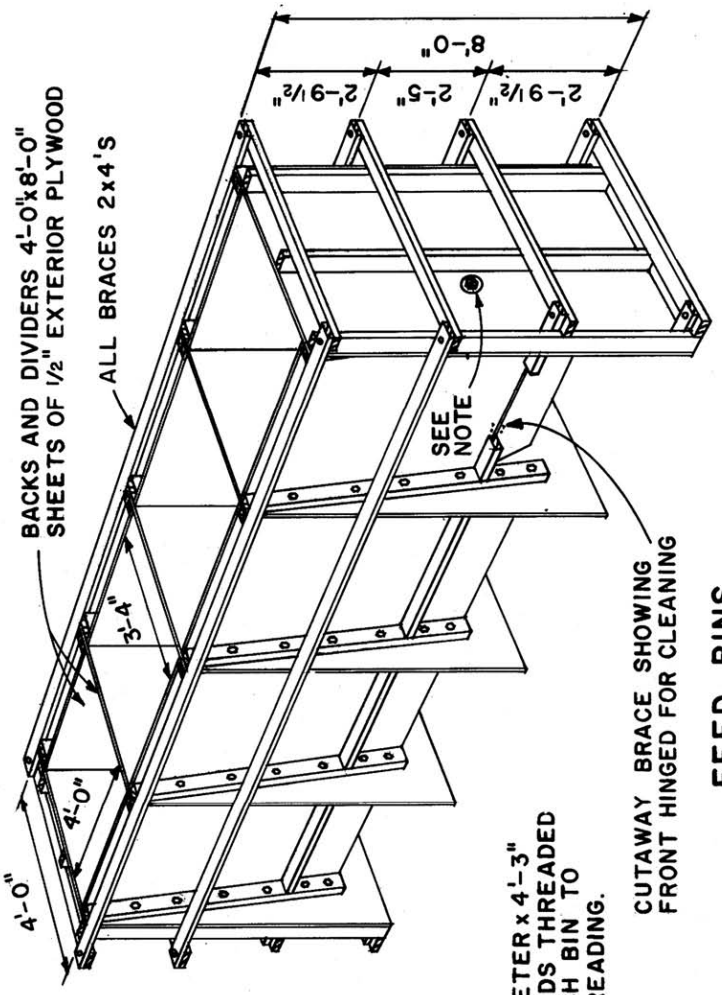
12" 6" 0 1' 2' 3'

CATTLE & AUCTION BARN

- Elevation A

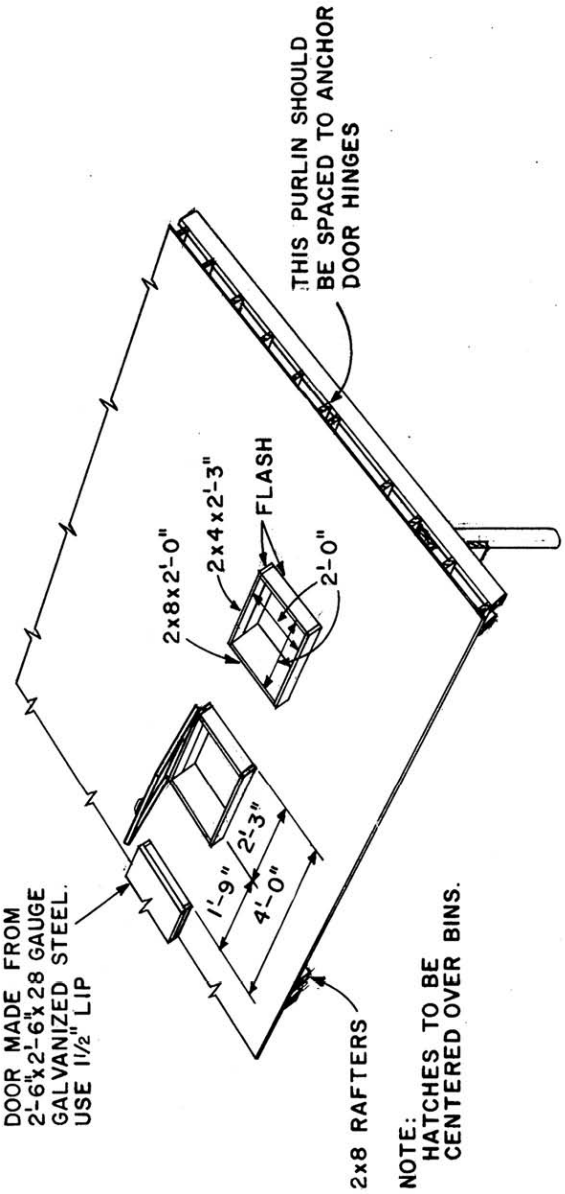


- Feed Bins



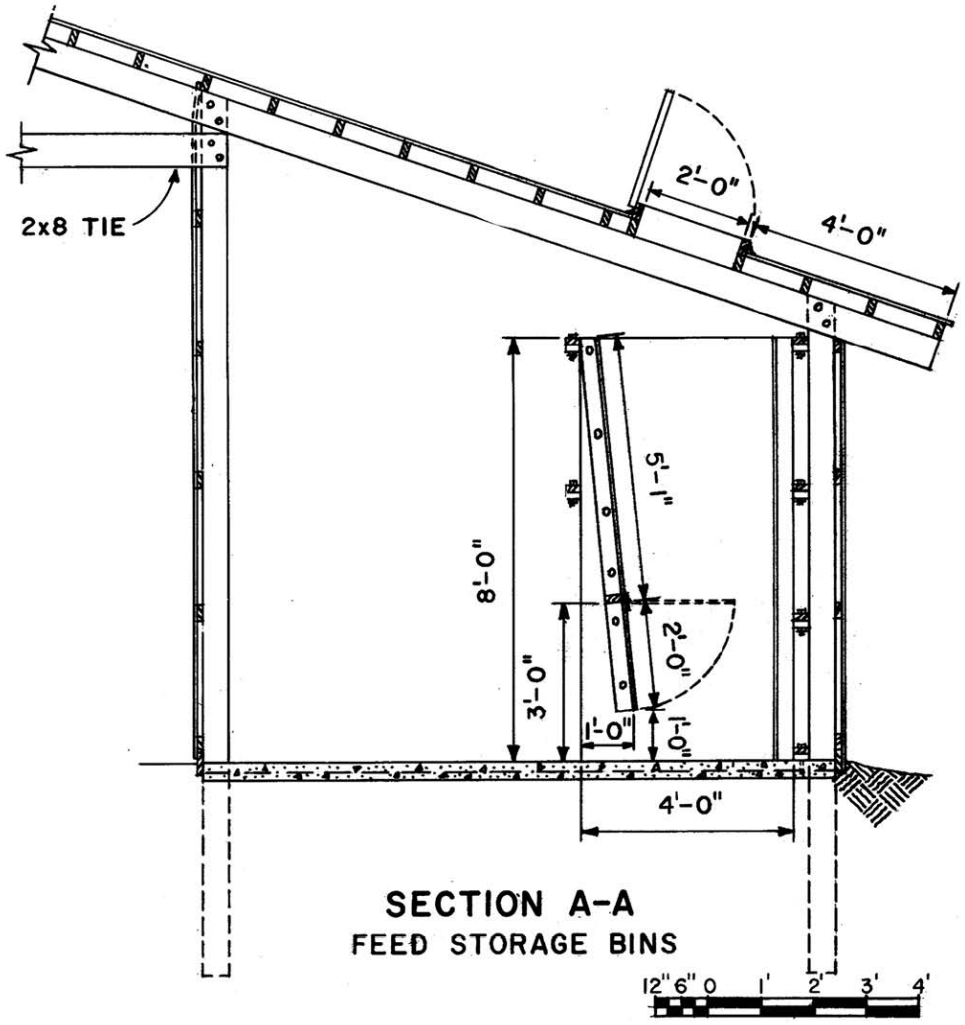
FEED BINS
PERSPECTIVE

- Roof Hatches for Filling Bins



ROOF HATCHES FOR FILLING BINS
PERSPECTIVE

- Section A-A of Feed Storage Bins



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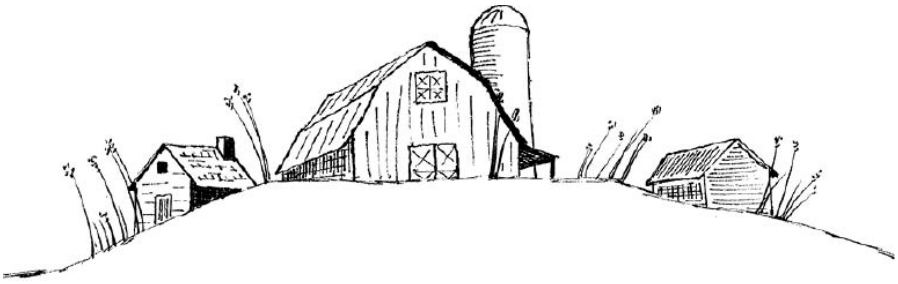


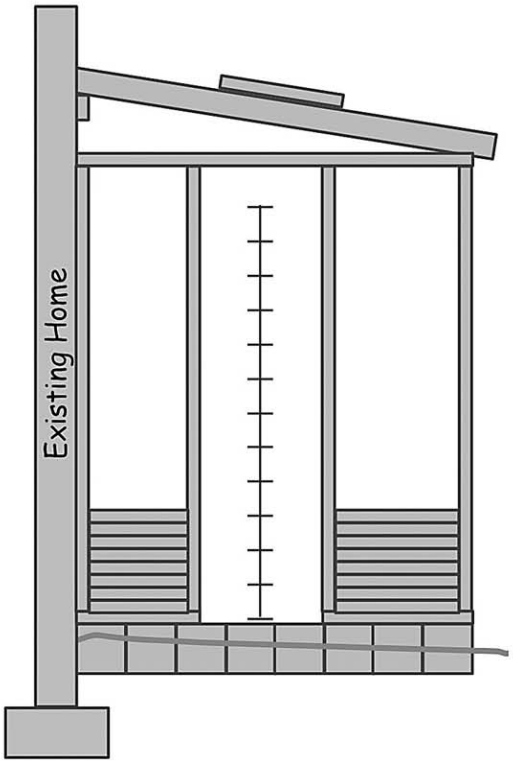
Chapter 11: Greenhouses

Plans Include:

- 5x8 Lean-To Greenhouse
- 7x10 A-Frame Greenhouse
- 10x21 Hoop Greenhouse

5X8 Lean-To Greenhouse

• Perspective • Bill of Material



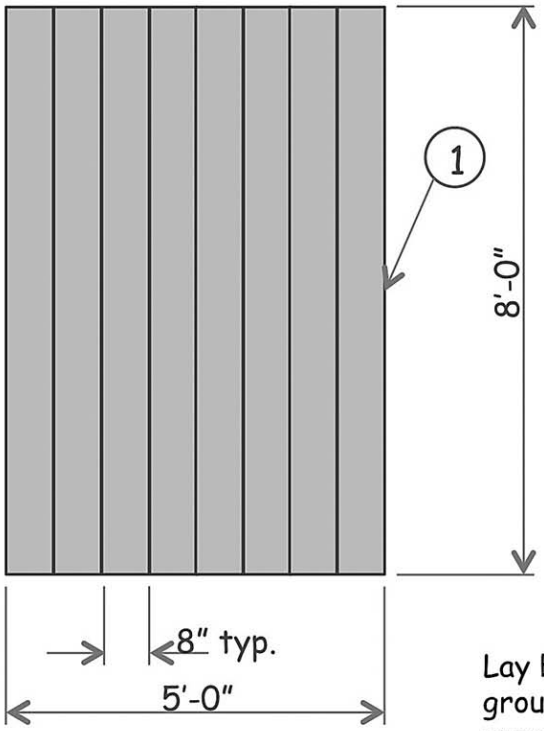
Bill of Material

Item	Qty	Description
1	8	8x8 timber x 8'-0"
2	6	2x4 x 5'-9"
3	1	2x4 x 8'-0"
4	2	2x4 x 7'-5"
5	13	2x4 x 6'-0"
6	1 box	3" long 10d nails
7	2	2x4 x 1'-9"
8	2	2x4 x 2'-0"

Item	Qty	Description
9	2	2x4 x 5'-4"
10	2	2x4 x 1'-5"
11	2	2x4 x 1'-8"
12	1	roof vent
13	2	zippers
14	2	wall vents
15	1 roll	UV resistant polyethelyne

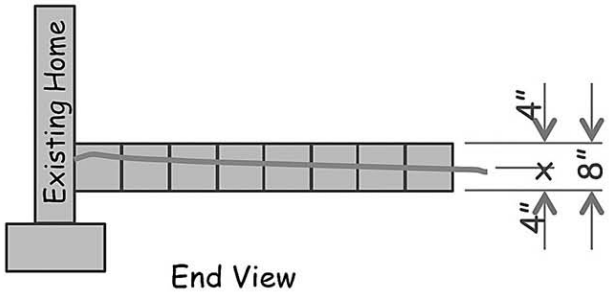
5X8 LEAN-TO GREENHOUSE

- Top View & End View Timber Foundation



Top View

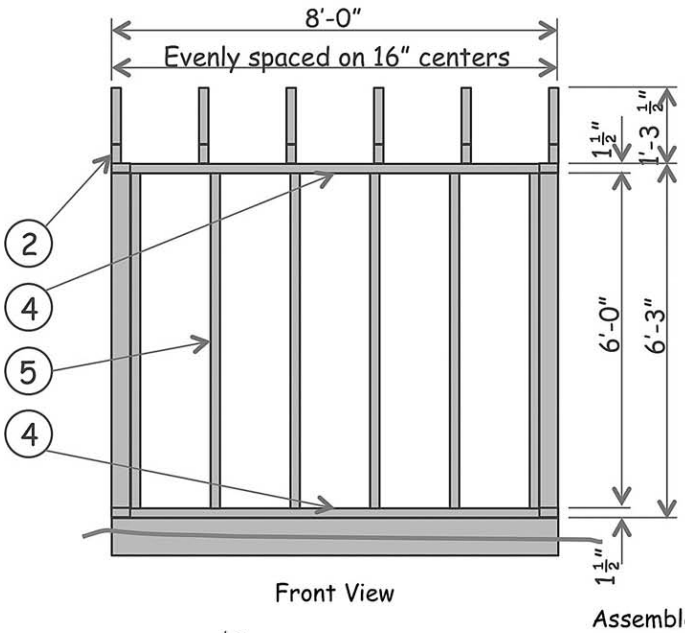
Lay base timbers on ground buried approximately one half the height of the wood.



End View

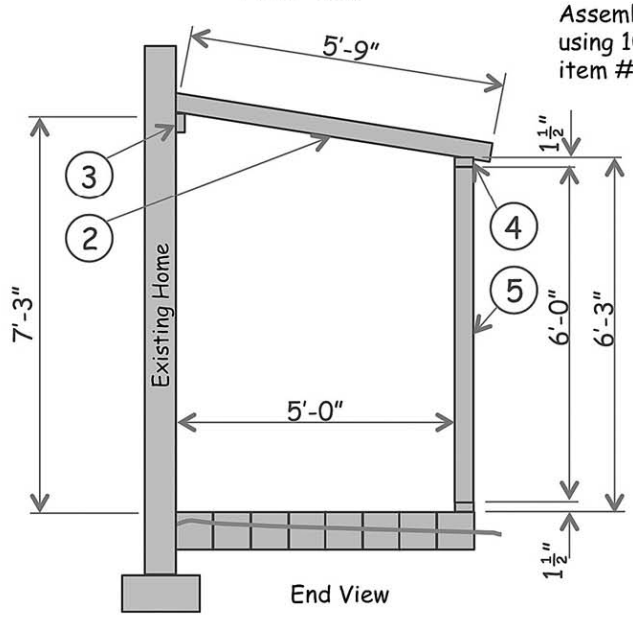
5X8 LEAN-TO GREENHOUSE

- Top & End View of Frame



Front View

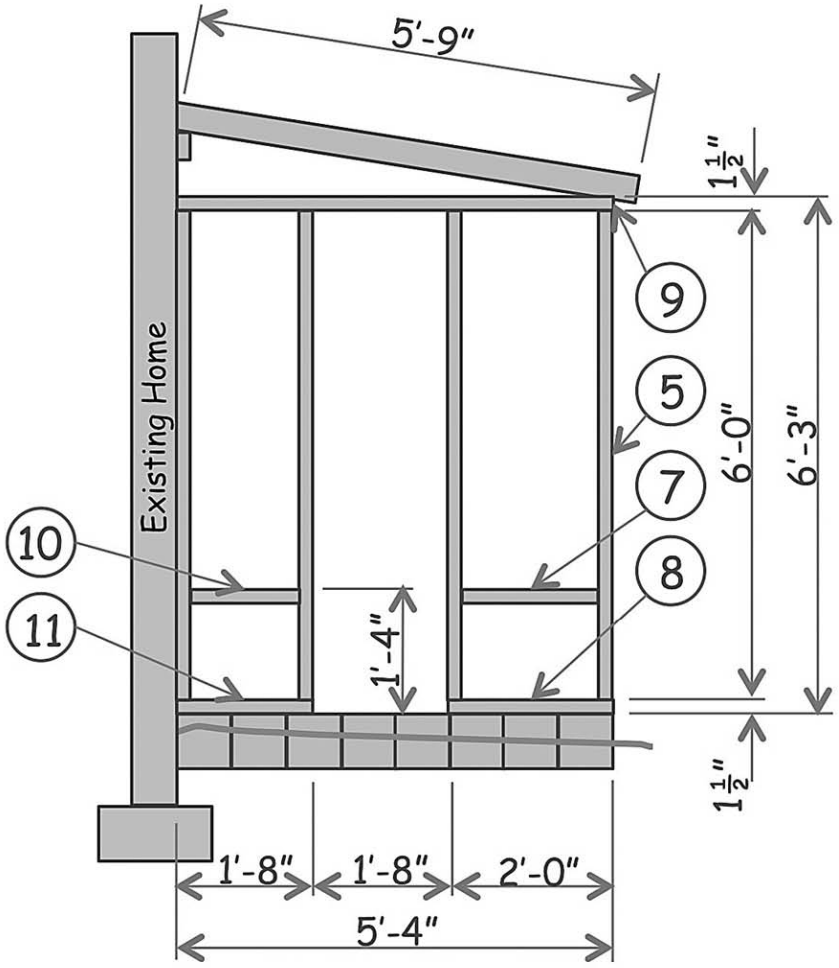
Assemble frame using 10d 3" nails item #6.



End View

- End Frame

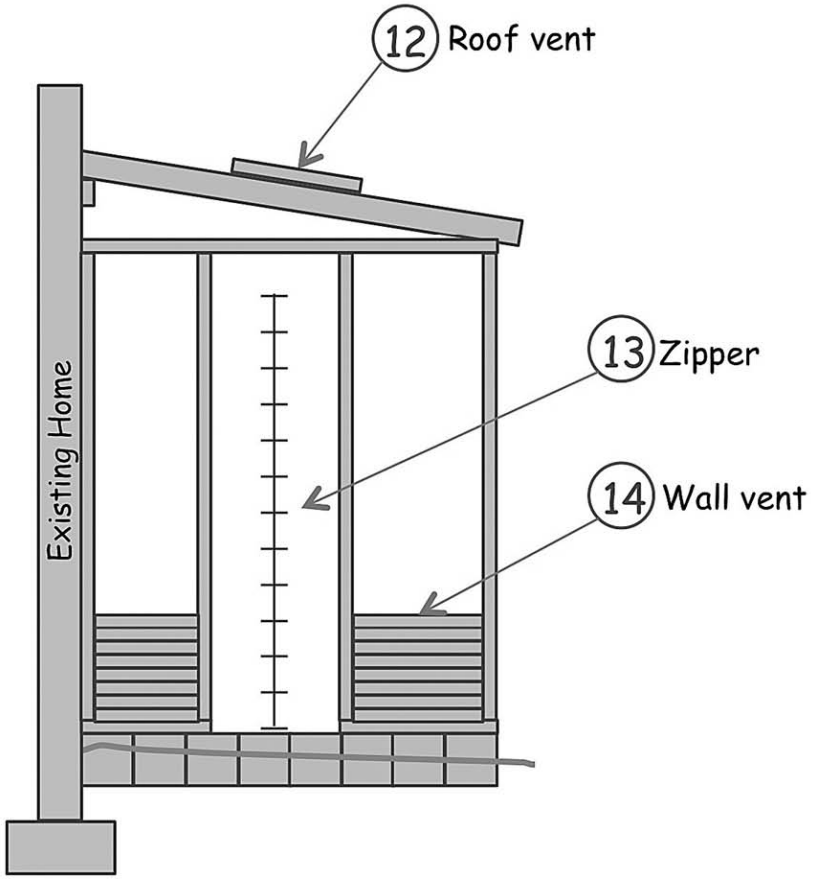
Assemble end frame using 10d 3" nails item #6.



End View

- Final Assembly

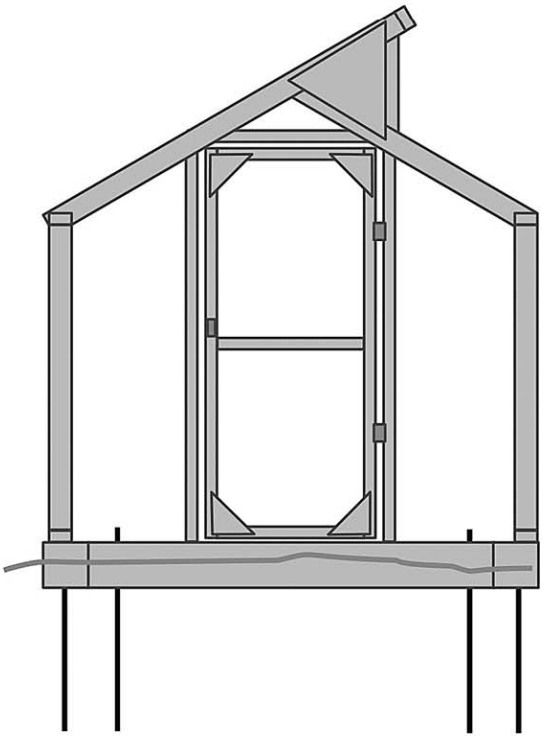
Install vents and cover structure with UV resistant polyethylene or fiberglass panels.



End View

7x10 A-Frame Greenhouse

• Perspective • Bill of Material



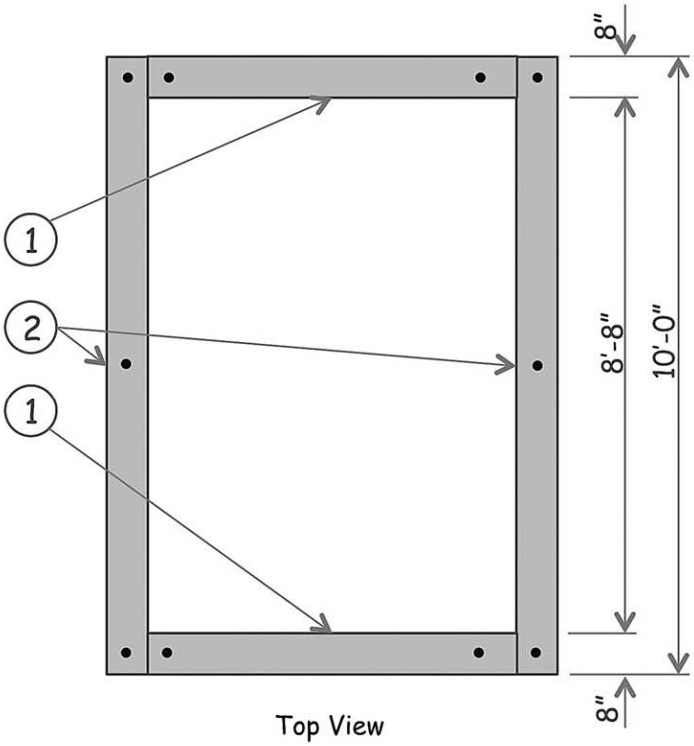
Bill of Material

Item	Qty	Description
1	1	8x8 timber x 6'-0"
2	2	8x8 timber x 10'-0"
3	10	1/2" dia. rebar x 3'-0" LG
4	5	2x4 x 10'-0"
5	6	2x4 x 6'-0"
6	6	2x4 x 4'-0"
7	12	2x4 x 4'-6"
8	6	2x4 x 1'-6"
9	1 box	10d nails x 3" LG
10	20	1x4 x 1'-10 1/4"

Item	Qty	Description
11	1 roll	UV resistent poylethylene
12	6	1/2" plywood x 1'-3" x 1'-9"
13	3	2x2 x 2'-2"
14	2	2x2 x 5'-9"
15	4	2x4 x 5'-10"
16	4	1/2" plywood x 6" x 6"
17	2	hinges
18	1	handle
19	1 box	#8 wood screws x 2 1/2" LG
20	1 box	#8 wood screws x 1 1/2" LG

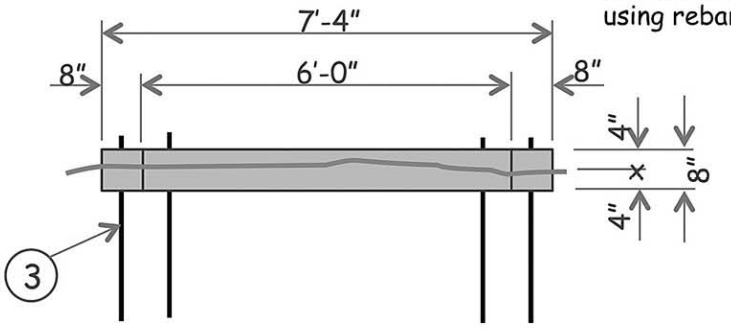
7x10 A-Frame Greenhouse

- Top & End View of Timber Foundation



Top View

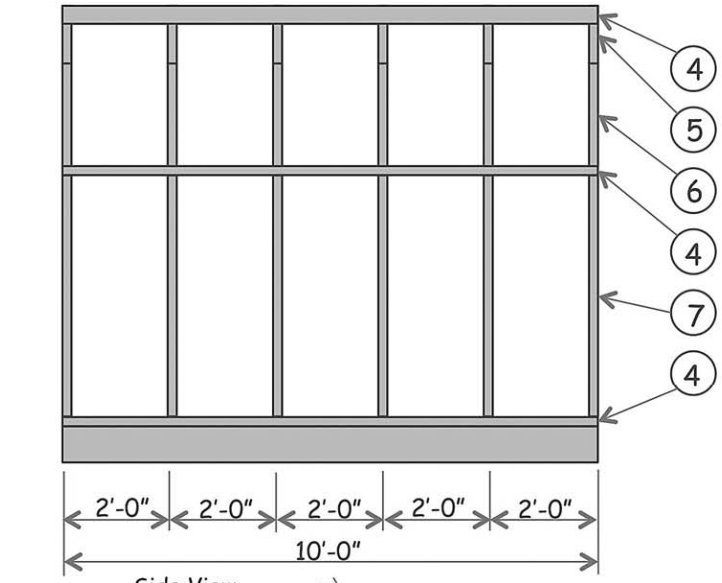
Assemble base frame.
Anchor to ground
using rebar item #3.



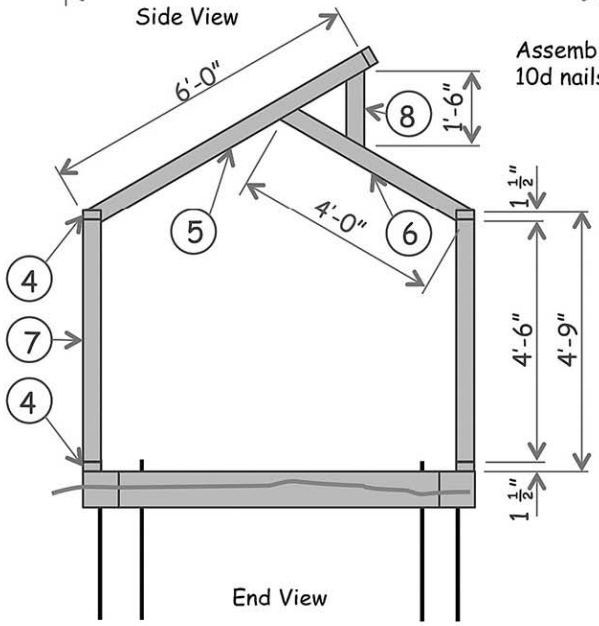
End View

7X10 A-FRAME GREENHOUSE

- Side & End View of Frame



Side View

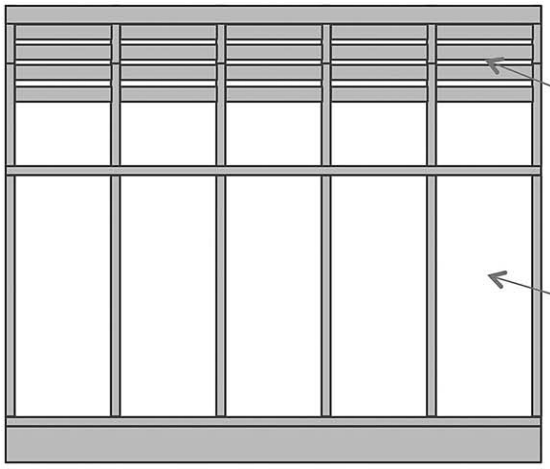


Assemble framing using 10d nails item #9.

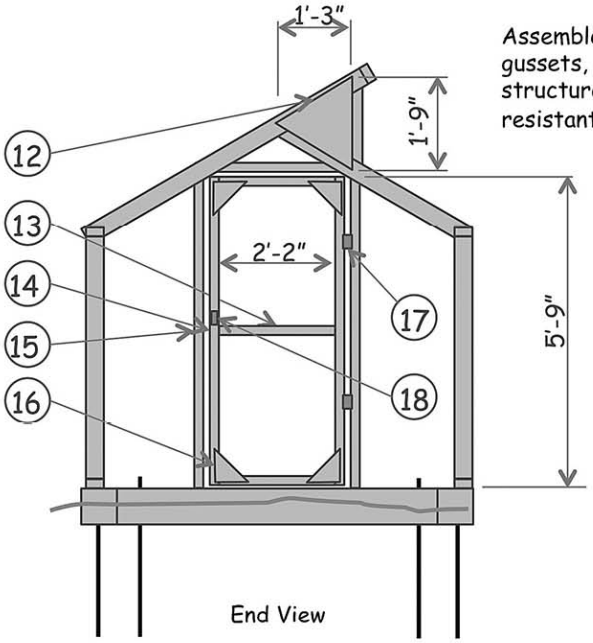
End View

7X10 A-FRAME GREENHOUSE

- Final Assembly



Side View

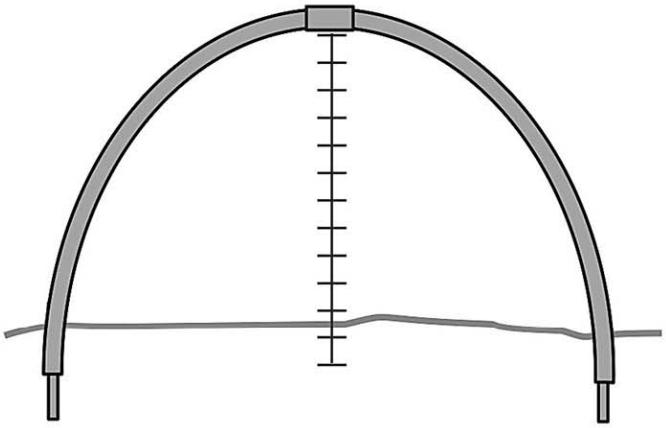


Assemble door , install gussets, and cover structure with UV resistant polyethylene.

End View

10x21 Hoop Greenhouse

• Perspective • Bill of Material



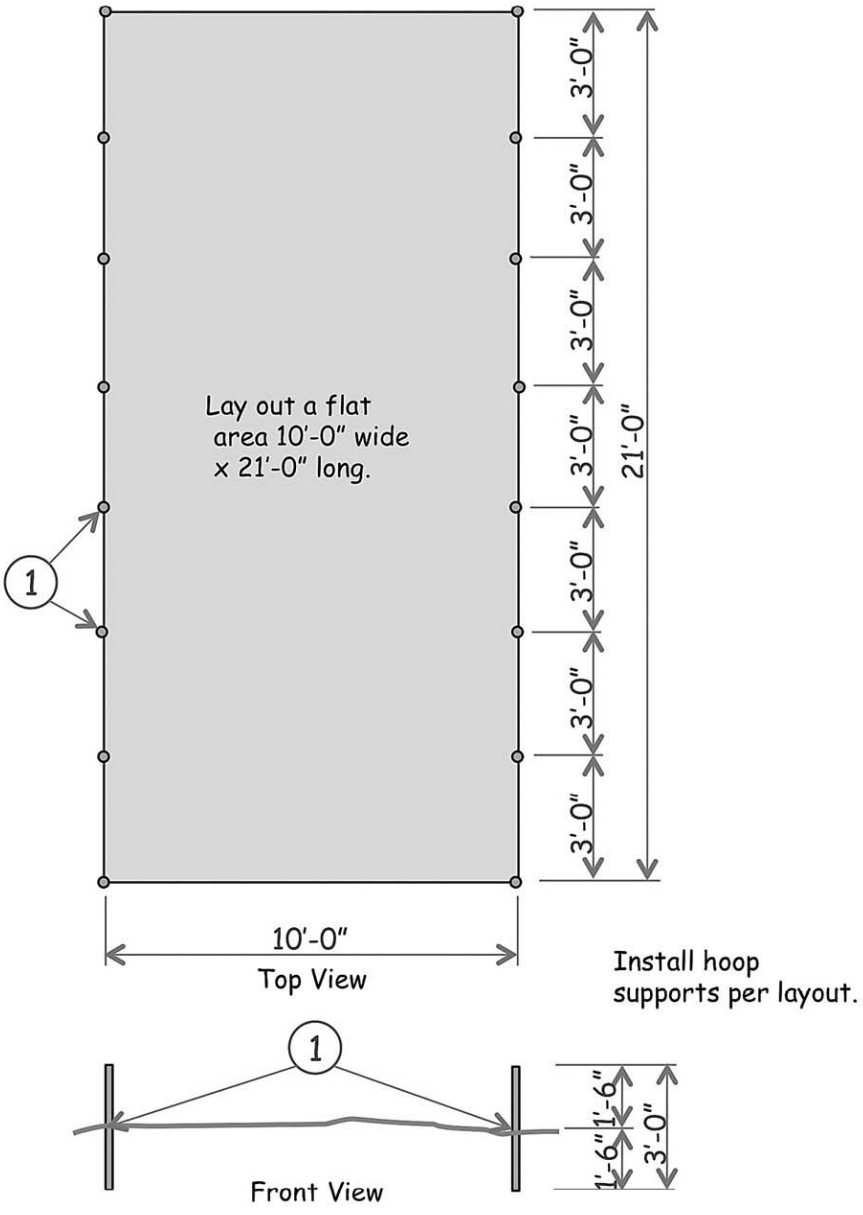
Bill of Material

Item	Qty	Description
1	16	1/2" PVC pipe x 3'-0"
2	6	3/4" cross tee
3	16	3/4" PVC pipe x 10'-0"
4	2	3/4" tee

Item	Qty	Description
5	1	Zipper
6	1 roll	UV resistant polyethylene
7	48	3/4" PVC x 6"
8	1 can	PVC cement

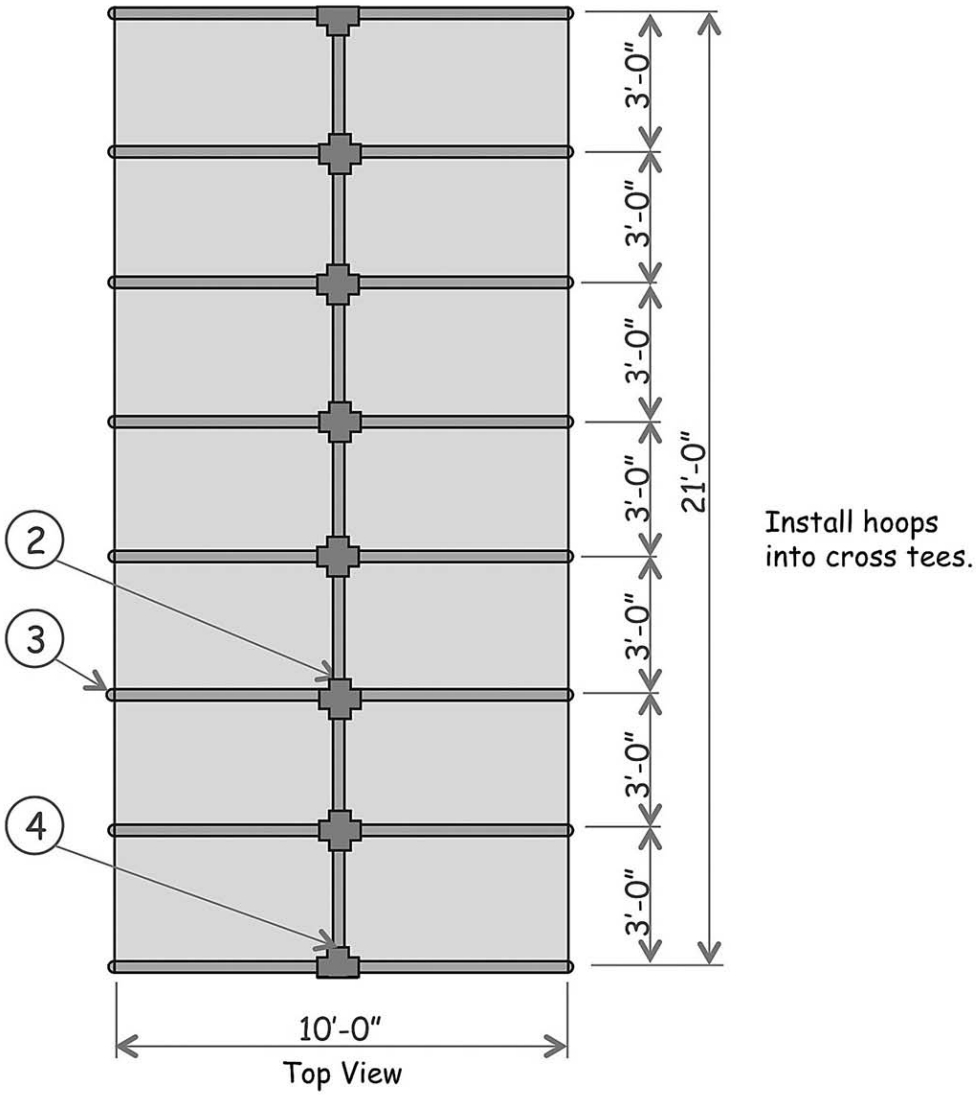
10x21 Hoop Greenhouse

- Top & Front Views of Support Stakes



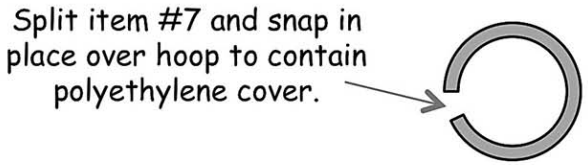
10X21 Hoop Greenhouse

- Top View of Hoops

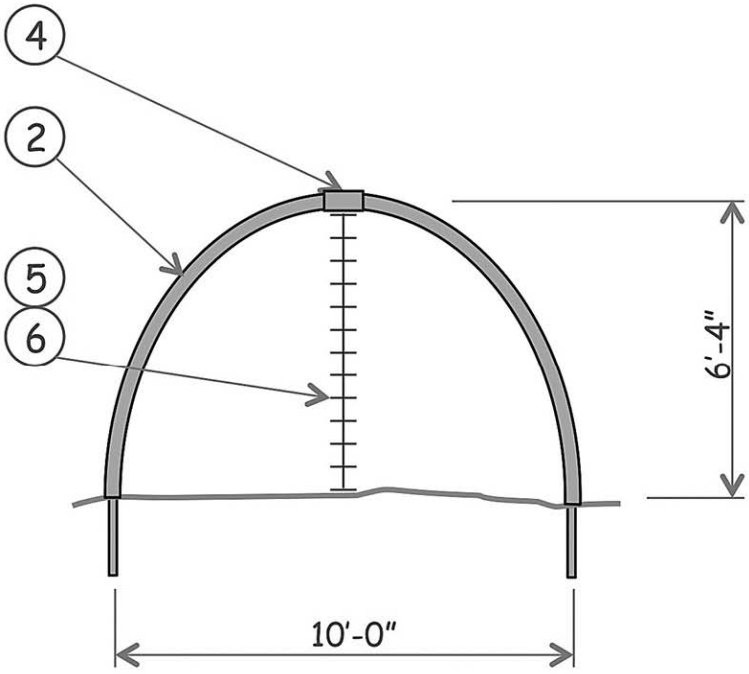


10x21 Hoop Greenhouse

- Final Assembly



Enlarged view of item #7.



Front View

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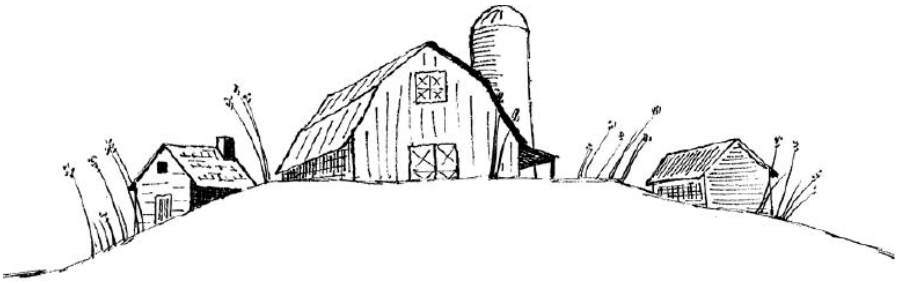

Chapte 12: Case Studies

BUILDING BARNS

Mark Johnson
Sales manager, Green Design and Construction LLC
info@greendesignandconstruction.com
www.greendesignandconstruction.com

Mark Johnson started his building career in 1973 by building pole barns, and in 1976, he built his first home from a timber frame barn he salvaged, moved, and rebuilt. He now buys, restores, and builds pioneer farm log cabins and timber frame barns into homes and barns.

Johnson said the three most important design considerations when selecting a building plan are functionality, aesthetics, and cost. Before building a new structure, he recommends homeowners perform a comprehensive wants/needs analysis for the building's function. He said to estimate the building's basic cost in a way that puts a dollar amount on the elective options so builders can prioritize each option according to whether it fits within the budget. He also explained the size of the barn or shed will dictate the amount of time and skill, as well as the types of tools, required.

"Every job takes less time with some help, and if the help has experience it's a plus," he said.

Johnson said floating slabs are the most economical flooring option if a floor surface is necessary, but in general, barns and sheds do not require very complex foundations. Floating slabs can resist frost heave, but if the building does not require a floor, post and beam foundations are the most economical option. He suggests using steel siding and roofing on buildings because they not only provide a maintenance-free exterior finish, but they also replace the need for sheathing on a building.

One thing he has noticed from his experience building barns is many people prefer the look of the traditional barn. He recommends salvaging an existing barn or home as a great way to achieve the look of a traditional building.

“There are plenty [of barns] available in the Midwest, and most owners would be glad to see them salvaged and rebuilt instead of bulldozed and burned.”

STORAGE SHEDS I

Gen Sterenberg
Grand Rapids, Michigan

Gen Sterenberg and her husband built a 12-foot by 16-foot storage shed in her Michigan backyard that she uses to store items that just won’t fit in her garage. Sterenburg said she and her husband decided on that size for their shed because they wanted to keep the building small enough that it did not need a building permit. She and her husband originally planned to do the work themselves, but when their friend who is a licensed builder offered to build it for them, they took him up on his offer and worked alongside him.

“We were very happy with our building,” she said. “We wish we had made it larger, but then is it ever big enough? We really didn’t want

to take up more yard space, and we didn’t want to deal with building permits.”

Sterenberg’s shed houses garden hoses, lawn sprinklers, shovels, rakes, a rototiller, boating equipment, large carpentry tools, beach toys, and other things that just don’t seem to have a proper place of their own. Although the shed currently only has four walls and a concrete slab foundation, she hopes to install freestanding shelves to offer more storage options. The shed isn’t wired for electricity, which is acceptable most of the time. In those instances where the Sterenbergs need a light source, they run an extension cord from the house.

The advice she offers to other homeowners looking to build a shed or other building on their property is to check the zoning and building codes for their area. She also suggests that homeowners opt to build a larger structure as opposed to a small one.

“Build large because whatever size it is, it’s not big enough!”

STORAGE SHEDS II

Thomas H. Kocourek
Two Rivers, Wisconsin

In 2009, Thomas Kocourek built a 25-foot by 25-foot two-car garage and workshop, which he attached to a heated workshop on his 5-acre hobby farm. Because of the work he does on his hobby farm, Kocourek said he is always repairing some piece of equipment or working on a small project and said he’d need a larger heated workspace. He hired a contractor to work on the structure, and Kocourek did the electrical work on the building himself. He said he is pleased with the results of his building, but wishes the space was

larger. He is planning to build a 40-foot by 60-foot outbuilding in the next few years to store several big boats.

“I think the biggest mistake people make when building is they always wish it was bigger,” Kocourek said. “Often, limited funds are the reason for not building bigger or not using the most energy efficient designs.”

The first piece of advice Kocourek offers is to build large because he said homeowners will always wish they had more storage space. He also recommends that homeowners try to incorporate as many energy efficient designs as possible because energy costs will only continue to climb in the future.

In addition to the structure he built, Kocourek has a 105-year old barn on his property. He said he is always amazed at the engineering that went into building the structure and how well it has stood the test of time given the limited tools available when the building was constructed. He put on a new roof only five years ago and is replacing the weathered boards that have lasted more than 100 years.

“Old barns are a great piece of history. It is often cheaper in the long run to tear down those old barns and build new [structures], but preserving these great old historical buildings is worth the effort and added cost,” he said.

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